JANUARY 26, 1957 PAGES 169 TO 224

THE LANCET

Offices: 7, ADAM STREET, ADELPHI, W.C.2
Telegrams: LANCET, RAND, LONDON Telephone: TEMPLE BAR 7228 and 7229

No. IV OF VOL. I, 1957
No. 6961 VOL. CCLXXII

LONDON, SATURDAY, JANUARY 26, 1957
Founded 1823 PUBLISHED WEEKLY Registered as a Newspaper

Pp. 120—Price 1s. 6d.
Annual Subscription: £3 3s.

6 FEB 15 1957 Cont Copy

'SONERYL' THE ORIGINAL BUTOBARBITONE
Trade Mark Brand

manufactured by MAY & BAKER LTD

distributors: PHARMACEUTICAL SPECIALITIES (MAY & BAKER) LTD, DAGENHAM

Second Edition

THE CARE OF TUBERCULOSIS IN THE HOME

By JAMES MAXWELL, M.D., F.R.C.P.
Physician, Royal Chest Hospital; Physician to the Ministry's Mass X-ray Unit; Consulting Physician, Royal National Sanatorium, Bournemouth; late Physician, St. Bartholomew's Hospital.

Demy 8vo 114 + xii Illustrations 7s. 6d. net, plus 5d. postage

Hodder & Stoughton Ltd., 20, Warwick-square, London, E.C.4

Sixth Edition *Now available*

PRINCIPLES OF MEDICAL STATISTICS

By A. BRADFORD HILL, C.B.E., D.Sc., Ph.D., F.R.S.

Demy 8vo 314 + x 10s. 6d. net, plus 6d. postage

Revised and enlarged (containing a new chapter on Clinical Trials and 16 pages of random sampling numbers).

The Lancet Limited, 7, Adam-street, Adelphi, London, W.C.2.

UNITED STATES OF AMERICA AND CANADIAN SELLING RIGHTS HELD BY OXFORD UNIVERSITY PRESS, INC.
114, Fifth Avenue, New York, 11, N.Y., U.S.A.

CAREERS IN MEDICINE

Edited by P. O. WILLIAMS, M.A. (Cantab.), M.B., B.Chir., M.R.C.P.

With contributions from 49 eminent medical authorities

Cr. 8vo 292 pages Price 15s. net, plus 1s. 4d. postage

This book outlines the particular qualities of mind, the type and amount of specialised training, required in each branch of the Medical Profession.

"... it should be in the hands of everyone who has to advise medical students, and certainly should be consulted by every newly-qualified doctor."—*The Practitioner.*

Hodder & Stoughton Ltd., 20, Warwick-square, London, E.C.4

Third Edition

ABDOMINAL OPERATIONS

By RODNEY MAINGOT, F.R.C.S.
Surgeon, Royal Free Hospital

Completely revised. 74 Chapters (11 new). 1594 Illustrations 11 Colour Plates. 1568 Pages. Price £8 10s. net.

H. K. Lewis & Co. Ltd., 136, Gower-street, W.C.1

THE LAW AND ETHICS OF DENTAL PRACTICE

By R. W. DURAND, M.R.C.S., L.R.C.P.
Formerly Secretary of the Medical Protection Society
and
D. MORGAN, L.D.S. (Leeds)
Formerly Deputy Dental Secretary of the British Dental Association

Foreword by Professor R. V. BRADLAW, M.D.S. Dunelm, F.D.S., M.R.C.S. Eng.
Professor of Oral Pathology, Durham University
Director, Newcastle-upon-Tyne Dental School

Expert guidance on the many problems which confront the dentist

Demy 8vo 98 + viii Price 7s. 6d. net, plus 7d. postage

Hodder & Stoughton Ltd., 20, Warwick-square, London, E.C.4

IN THE MENTAL HOSPITAL

Eleven articles reprinted from THE LANCET.

A group of articles chiefly concerned with the value of active occupation and work for mental patients and the means whereby it is best provided.

72 pages. Price 2s. 6d. (postage 4d.)

The Lancet Limited, 7, Adam-street, Adelphi, London, W.C.2

LATEST PUBLICATIONS

A New Book *Now Available*

PRINCIPLES OF EPIDEMIOLOGY

By IAN TAYLOR, M.D., M.R.C.P., D.P.H., and JOHN KNOWELDEN, M.D., D.P.H.

25 Illustrations. 30s.

A TEXTBOOK OF SURGICAL PATHOLOGY

By C. F. W. ILLINGWORTH, *C.B.E.*, Ch.M., F.R.C.S. (Edin.), and B. M. DICK, M.B., F.R.C.S. (Edin.).

New (Seventh) Edition. 322 Illustrations. 63s.

THE QUEEN CHARLOTTE'S TEXTBOOK OF OBSTETRICS

By Members of the Clinical Staff of the Hospital.

New (Ninth) Edition. 4 Coloured Plates, and 230 Text-figures. 45s.

Ciba Foundation Symposia

THE NATURE OF VIRUSES

57 Illustrations. 42s.

IONIZING RADIATIONS AND CELL METABOLISM

48 Illustrations. 45s.

J. & A. CHURCHILL LTD., 104 GLOUCESTER PLACE, LONDON, W.1

Serpasil

(the alkaloid reserpine from Rauwolfia)

ANTIHYPERTENSIVE

GRADUAL AND SUSTAINED REDUCTION

OF BLOOD PRESSURE

SYNERGISTIC EFFECT WITH OTHER

ANTIHYPERTENSIVES

MODERATE SLOWING OF HEART-RATE

CALMING EFFECT

Tablets of 0.1 mg. and 0.25 mg. in bottles of 25, 100 and 500. Elixir containing 0.25 mg./5 c.cm. in bottles of 100 c.cm. 1 mg. and 4 mg. tablets, 1 mg. and 2.5 mg. ampoules also available.

C I B A

'Serpasil' is a registered trade mark. Reg. user

CIBA LABORATORIES LIMITED, HORSHAM, SUSSEX

Telephone: Horsham 4321. Telegrams: Cibalabs, Horsham.

8/6

JAN. 26, 1957 PAGES 169 TO 224

THE LANCET

A JOURNAL OF BRITISH AND FOREIGN MEDICINE, SURGERY, OBSTETRICS, PHYSIOLOGY, PATHOLOGY, PHARMACOLOGY, PUBLIC HEALTH, AND NEWS

No. 6961 LONDON: SATURDAY, JANUARY 26, 1957 CCLXXII

CONTENTS

THE WHOLE OF THE LITERARY MATTER IN THE LANCET IS COPYRIGHT

ORIGINAL ARTICLES

Acne Vulgaris — R. M. B. MACKENNA, F.R.C.P. 169
Recurrent Goitre — J. E. PIERCY, F.R.C.S.; M. J. LANGE, F.R.C.S.E. 177
The Treatment of Tetraethyl Lead Poisoning — P. R. BOYD, M.B.; G. WALKER, M.R.C.P.; I. N. HENDERSON, M.B. 181
Hypothermia by Internal Cooling — H. H. KHALIL, M.B. 185
The B.C.G. Lesion in Sarcoidosis — PAUL FORGACS, M.R.C.P.; C. K. MCDONALD, M.D.; M. O. SKELTON, M.B. 188
Plasma-œstrogen Levels — J. R. K. PREEDY, M.R.C.P.; ELSIE AITKEN, B.SC. 191
Pulled Elbow — M. R. SALKIND, M.R.C.S. 192
Afferent-loop Strangulation Following Partial Gastrectomy — F. C. HOYTE, F.R.C.S.; W. H. W. JAYNE, F.R.C.S.; W. K. PALLISTER, F.F.A. R.C.S. 193
Management of Respiratory Insufficiency After Poliomyelitis — N. JOELS, M.B.; L. J. HURWITZ, M.R.C.P.E.; F. E. DREIFUSS, M.R.C.P. 194

PRELIMINARY COMMUNICATION

Reagin Content of Chromatographic Fractions of Human Gamma-globulin — J. H. HUMPHREY, M.D.; R. R. PORTER, PH.D. 196

SPECIAL ARTICLES

Towards Preventing Suicide — R. W. PARNELL, M.R.C.P.; IAN SKOTTOWE, M.R.C.P. 206

MEDICAL SOCIETIES

Royal Society of Medicine: The Nephrotic Syndrome 197

REVIEWS

Notices of Books 198

LEADING ARTICLES

NURSE AND DOCTOR 199
MÉNIÈRE'S DISEASE 200
PRESSURE AND FLOW IN ARTERIES 201
The New Minister of Health 202

ANNOTATIONS

Saving the Potential Suicide 203
Failure of Arterial Grafts 203
Austerity Diets 204
Constrictive Pericarditis 204
Richard Pfeiffer 205
Sepsis in the Newborn 205
Medical Education 205

BEFORE OUR TIME

Old Moore and His Almanack 209

LETTERS TO THE EDITOR

Treatment of Sore Throat (Dr. John Fry; Flying Officer A. R. Smith, M.B.; Dr. E. Tuckman; Dr. Bernard Sweetman) 211
The Rh Blood-groups (Mr. P. M. Sheppard, D.PHIL.) 212
Blood-groups and Disease (Dr. C. A. Clarke, Dr. R. B. McConnell, Mr. P. M. Sheppard, D.PHIL.) 212
Possible Significance of Secretor (Mr. A. J. Cain, D.PHIL.) 212
A Rapid Blood-sugar Screening Method (Dr. J. Kohn) 213
Analgesic Drugs in Childbirth (Dr. Mark Swerdlow) 213
Unmarried Parenthood (Dr. Alex Comfort) 213
Shortage of Radiographers (Mr. N. Robinson, M.S.R.) 214
Syringe Carrier (Dr. C. K. McDonald, Mr. J. Pirnie, F.P.S.) 214
Alloxan and Carcinoma of the Liver (Dr. G. E. Loxton) 214
Head Injuries (Mr. G. L. Alexander, F.R.C.S.) 215
The Relation Between Smallpox Vaccination and Poliomyelitis (Dr. H. D. Chalke, Mr. F. L. Clark) 215
Cardiac Arrest (Prof. F. A. R. Stammers, F.R.C.S.) 215
Fluoridation: A Misquotation (Sir Rudolph Peters, F.R.C.P., F.R.S.) 216
Prolonged Pyrexia in Children (Dr. Hugh Wallis) 216
Reflux Œsophagitis (Prof. Charles Wells, F.R.C.S., Mr. J. H. Johnston, F.R.C.S.) 217
The Future of Nursing (Miss Muriel Edwards, S.R.N.; Miss L. J. Ottley, D.N.) 217
Recurrent Motor Paralysis (Dr. G. E. Breen, Dr. R. T. D. Emond) 218
Viva-voce Examinations (Dr. E. R. Matthews) 218
Vagitus Uterinus (Dr. B. Sandler; Dr. B. Broadbent) 219
Mean Venous Pressures in the First Hours of Life (Dr. R. E. Bonham Carter, Dr. Jean Smellie) 219
A Simple Selective Test for Nurses (Mr. T. Roberts, S.T.D.) 219
X Rays and Leukæmia (Dr. J. Rabinowitch) 219

PUBLIC HEALTH

B.C.G. Vaccination 210
Births and Deaths in 1956 210

IN ENGLAND NOW

A Running Commentary by Peripatetic Correspondents 210

MEDICINE AND THE LAW

The Duty of Care 220
"Truth Drugs" 221

OBITUARY

Eric Barrington Brooke 221
Rufus Clifford Thomas 222

NOTES AND NEWS

World Health Organisation 223
Quacks Through the Ages 223
Vidius 223
Maternity Film 223
Training of the District Nurse 223
University of Bristol 223
University of St. Andrews 223
Welsh National School of Medicine 223
Empire Rheumatism Council 223
Diary of the Week 224
Appointments 222

Monographs of the Physiological Society

No. 1. Sympathetic Control of Human Blood Vessels

H. BARCROFT, M.D., M.R.C.P., and H. J. C. SWAN, Ph.D., M.R.C.P. 18s. net

No. 2. Man in a Cold Environment

A. C. BURTON, Ph.D., and O. G. EDHOLM, M.B., B.S. 30s. net

And now:

No. 3. Neural Control of the Pituitary Gland

G. W. HARRIS, Sc.D., M.D., F.R.S. 30s. net

No. 4. The Physiology of Gastric Digestion [Late February]

A. H. JAMES, D.M., M.R.C.P., M.D. 28s. net

EDWARD ARNOLD (PUBLISHERS) LTD.

Issued January 1st

'THE COMPEND' ADDENDUM

By **WILLIAM HETHERINGTON.** 64 pages. **4s.**, post 2d.
Contains monographs of the proprietaries issued during 1956 and gives details of the various other changes which have taken place. Invaluable when used in conjunction with 'The Compend' itself.

Ready Shortly

AN ATLAS OF THE COMMONER SKIN DISEASES

By **HENRY SEMON.** Assisted by **H. T. H. WILSON.** *Fifth Edition.* Pp. 384, with 153 colour plates. **105s.**, post 1s. 6d.
Portrays from the living subject, and in natural colour, a collection of the dermatoses most frequently seen in the routine of out-patient practice. The text has been thoroughly revised and brought up to date and certain new plates have been added.

SYMPTOMS AND SIGNS IN CLINICAL MEDICINE

By **E. NOBLE CHAMBERLAIN.** *Sixth Edition.* Pp. 508, with 374 illustrations. **35s.**, post 1s. 6d.
Not only describes the common symptoms and physical signs of disease, but also takes the reader a stage further to the visualization of symptoms and signs as forming a clinical picture of a pathological process. Completely revised and many new illustrations added.

A SYNOPSIS OF CHILDREN'S DISEASES

By **JOHN RENDLE-SHORT.** *Second Edition.* Pp. 632. Illustrated. **35s.**, post 8d.
Assembles all the relevant facts tidily and in a small compass and is designed particularly for undergraduate students, general practitioners, and those taking the D.C.H. A careful revision has been made in order to bring the text completely up to date.

JOHN WRIGHT & SONS LTD., BRISTOL

Just Published by
The Year Book Publishers Inc., Chicago:

EXAMINATION OF THE NERVOUS SYSTEM

A Student's Guide

By A. T. STEEGMANN, M.D.
Professor of Neurology, Kansas City

CONTENTS: Important Principles in Neurologic Diagnosis. Neurologic History. Examination of the Patient: The Cranial Nerves; The Cranium; Examination of the Motor System; Examination of the Reflexes; Examination of Co-ordination; Abnormal Movements; Muscular Spasms; The Sensory Examination; Examination of the Autonomic Nervous System; The Comatose Patient. Bibliography. Index.

1956 5¼ × 7¾ 164 pages 40 illus. **28***s*

Distributed in the United Kingdom by
INTERSCIENCE PUBLISHERS, LTD.
88-90 Chancery Lane, London, W.C.2

RABRO-COMPANY · Rabro · NIJMEGEN-HOLLAND ·

the famous Dutch

RABRO TABLETS

for safe and effective treatment of

gastric ulcer, duodenal ulcer and **gastritis**

advantages:

+Speedy relief of pain by the carbonates aided by the spasmolytic effect of liquorice.

+Effective action by the liquorice-bismuth combination, viz:

spasmolysis, correcting gastric secretion and promoting circulation to the stomach;

protection, as the preparation disperses, forming a barrier film over the stomach wall, including the ulcerated area.

formula:

block liquorice	300 mg.
bismuth subnitrate	350 mg.
magnesium carbonate ..	400 mg.
sodium bicarbonate	200 mg.
frangula	25 mg.
calamus	25 mg.

dosage:
2 tablets 3 times daily after meals

packings:
tubes of 40 tablets of 1500 mg., dispensing packs of 500 tablets of 1500 mg.

manufactured by:
RABRO COMPANY N.V.
Nijmegen - - Holland

distributed by:
MACWILL & COMPANY LTD.
7 West Road - Kingston-on-Thames

full literature and many favourable clinical reports are available to the medical profession not advertised to the public

Introducing

COLLOZETS

Crookes new antibacterial lozenge

COLLOZETS present the simplest, most effective local treatment of mouth infections and sore throats due to coughs and colds. Based on an entirely new concept—the synergistic combination in one lozenge of tyrothricin and a quaternary ammonium compound—COLLOZETS bring speedy and prolonged relief from pain and irritation. The lozenges, though extremely potent, are completely non-toxic and may safely be given to children.

COLLOZETS
Trade Mark

each lozenge contains: 1 mg. tyrothricin
2 mg. celylethyldimethylammonium ethyl sulphate
in a pleasantly flavoured base

packing: 18 foil-wrapped lozenges in each pack
Basic N.H.S. cost 2/2

THE CROOKES LABORATORIES LIMITED · PARK ROYAL · LONDON · NW10

NEW

evenly sustained 'round-the-clock' bronchodilatation

12 HOURS PROPHYLAXIS IN BRONCHIAL ASTHMA WITH A *SINGLE* DOSE

'asmapax'

ionex-tab
(Brit. Pat. Appln. No. 25974)

works 'round-the-clock'

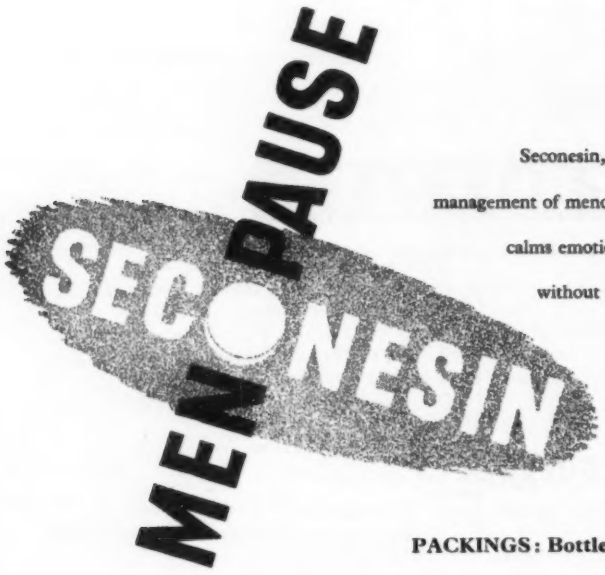
controlled ionic exchange feeds ephedrine evenly and without interruption into the blood stream providing 10-12 hours freedom from bronchospasm.

FORMULA
EPHEDRINE RESINATE 100 mg. (equivalent to ½ gr. Ephed. HCl.)
THEOPHYLLINE 65 mg., BROMVALETONE 150 mg., MEPHENESIN 50 mg.

AN ORIGINAL CPL RESEARCH PRODUCT

Average Basic N.H.S. cost of 12 hours prophylaxis—2d.

FOR CLINICAL SAMPLES, LITERATURE AND CASE REPORTS PLEASE WRITE TO
CLINICAL PRODUCTS LTD. RICHMOND SURREY



Seconesin, has proved most suitable for the management of menopausal symptoms. It relaxes and calms emotionally tense and anxious patients without making them drowsy. Subjective improvement, with a sense of well-being, occurs early in treatment in almost all cases.

PACKINGS: Bottles of 25, 100 and 500 tablets.

THE CROOKES LABORATORIES LIMITED • PARK ROYAL • LONDON NW10

New Preparations

pavacol
TRADE MARK

PAPAVERINE—CODEINE COUGH SYRUP

pavacol diabetic
Cough Syrup

The active ingredients of the original Pavacol syrup are retained but the carbohydrates have been omitted to make it safe for administration to diabetic patients without increasing hyperglycaemia.

pavacol pastilles
Bacteriostatic & Anti-tussive

These combine the anti-tussive ingredients of Pavacol syrup with the powerful bacteriostatic properties of Octaphen. This dual action relieves coughs and counteracts infections of the throat and mouth.

Literature and professional samples are available on request.

A KMD MEDICAL PRODUCT

WARD, BLENKINSOP & COMPANY, LIMITED

YORK HOUSE, 37, QUEEN SQUARE, LONDON, W.C.1.

Telephone : HOLborn 5992/6 (5 lines) Telegrams : Duochem, Westcent, London.

Children needing aspirin will readily take

Rasprin

1¼gr. soluble aspirin tablets specially formulated* and flavoured for children

*Acid. Acetylsalicyl. B.P. gr. 1.25
Calc. Carb. B.P. . . . . gr. 0.375
Acid. Cit. B.P. (Ezsic) . gr. 0.125

RASPRIN TABLETS disintegrate in the mouth so quickly that a child cannot choke with them.

Every 10 Rasprin tablets are packed in a plastic vial, so that the maximum amount of aspirin in any one container is 12½ grains.

Rasprin is not advertised to the lay public, and may be prescribed on Form E.C.10. Basic N.H.S. price is 4d. per vial of 10 tablets—exempt from Purchase Tax.

Professional samples and literature gladly supplied on request to the manufacturers

E.G.H. LABS
PERU STREET, SALFORD, 3
LANCS

Controlled purity in nutrition

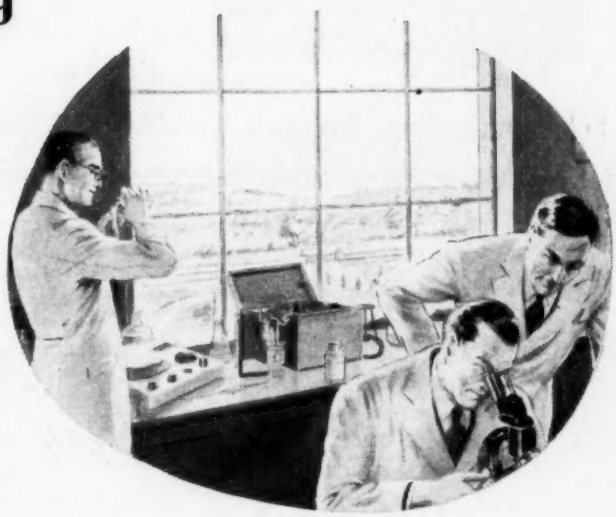
THE MEDICAL PROFESSION has always recognized the paramount importance of purity in food. To maintain this essential feature is therefore a constant care throughout the production of 'Ovaltine'.

'Ovaltine' is an original product—the result of prolonged research. It provides energizing nutrient elements and added vitamins in digestible form for general upbuild.

This delicious food beverage is prepared, under scientific control, in the 'Ovaltine' Factory which is considered to be the ideal of what a food factory should be. Here the highest standards of hygiene reinforce meticulous and constant testing by the 'Ovaltine' Research Laboratories.

These exceptional measures render 'Ovaltine' a food product of outstanding merit—controlled throughout for quality and purity.

Vitamin Standardization per oz.—
Vitamin B_1, 0.3 mg.; Vitamin D, 350 i.u.; Niacin, 2 mg.



OVALTINE Purity-Controlled Food Beverage

M.386

A. WANDER LIMITED, 42 UPPER GROSVENOR STREET, GROSVENOR SQUARE, LONDON W.1.

Aspirin *and* Ulcer

"ASPIRIN is a serious gastric irritant, particularly in peptic ulcer patients."

"Calcium aspirin does not have this irritant action unless it has deteriorated through standing, and it can be used with impunity, especially if prescribed in soluble form. This simple measure would, in our opinion, cut down significantly the incidence of hæmatemesis and exacerbations of ulcer symptoms."

British Medical Journal, July 2nd 1955

SOLPRIN provides calcium aspirin in pure and stable form

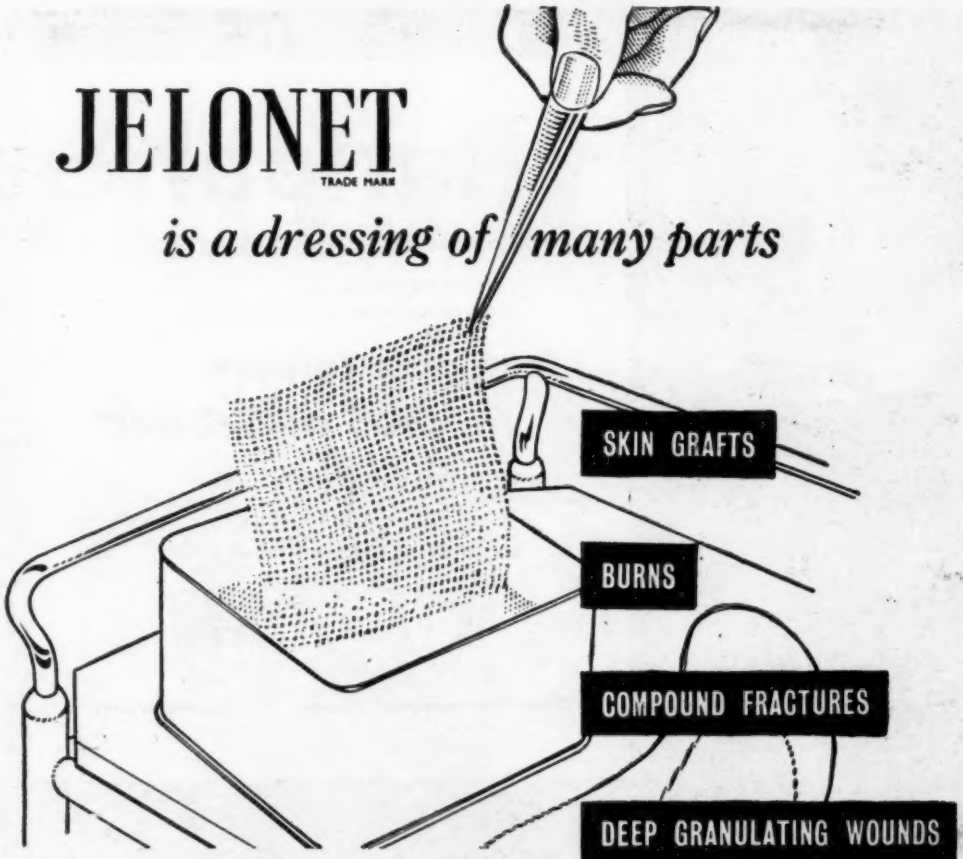
CODIS is a compound tablet that provides codeine and phenacetin and calcium aspirin, in place of the ordinary aspirin in Tab. Codein. Co. B.P.

Neither SOLPRIN nor CODIS is advertised to the public

RECKITT & COLMAN LTD., HULL & LONDON (PHARMACEUTICAL DEPT., HULL)

JELONET
TRADE MARK

is a dressing of many parts



'Jelonet' sterilized dressing, a Smith & Nephew product, is available in tins for immediate use in the hospital operating theatre or in your surgery. The non-adherent properties of 'Jelonet' protect the delicate epithelium and prevent dressing trauma, enabling healing of the wound to continue undisturbed. 'Jelonet' dressings are made from specially woven open-meshed gauze, thoroughly and evenly impregnated with soft paraffin containing 1.235 per cent. Balsam of Peru. Because 'Jelonet' is compatible with all antibiotics and medicaments, it is the ideal base for all combined dressings. Thus, by keeping a tin of 'Jelonet' handy, a non-adherent dressing and the desired medicament may be supplied simultaneously.

AVAILABILITY *For prescription on N.H.S form E.C.10*
Tins of 5, 10 or 36 pieces (non interleaved)
Tins of 36 pieces (interleaved) Single pieces in sealed envelopes (sterilized for use in patients homes)
Each piece 3¼″ x 3¼″ (9.52 cms x 9.52 cms)

For hospital use only
8 yard strips (folded zig-zag) 3¾″ wide (7.31 m x 9.52 cms)

JELONET
TRADE MARK

PARAFFIN GAUZE DRESSING B.P.C

an S&N product

SMITH & NEPHEW LIMITED • WELWYN GARDEN CITY • HERTS

Rarical
TRADE MARK
iron-calcium tablets
a new compound containing
ferrous calcium citrate with tricalcium citrate
Iron plus calcium
in one molecule
a white uncoated tasteless tablet
no gastrointestinal disturbances
outstanding therapeutic response
LITERATURE ON REQUEST
Ortho
Ortho Pharmaceutical Limited · High Wycombe · England
pregnancy
adolescence
menorrhagia
anaemia
infancy
lactation
Iron plus calcium
in one molecule
Each tablet contains iron, 25 mg., calcium, 85 mg.

POLYBACTRIN

antibiotic powder spray

INVALUABLE IN ALL BRANCHES OF SURGERY

Polybactrin provides a unique and economical means of applying a combination of Zinc Bacitracin, Neomycin Sulphate and Polymixin 'B' Sulphate—the three antibiotics of choice for topical use. The antibiotics are presented in an ultra-fine powder form dispersed under pressure with a propellant, and unlike other means of powder insufflation in common use, there is no risk of contamination of the antibiotics by airborne pathogens obtaining entry into the unit by suction.

A FRACTIONAL RELEASE GIVES COMPLETE DISPERSAL OF POWDER OVER THE WOUND

1. The *Polybactrin* unit offers a new technique for topical application of antibiotic therapy, enabling an efficient, economical and dry coverage of the wound area to be made.
2. The extensive range of bactericidal activity afforded by the triad of bacitracin, neomycin and polymixin gives an extremely wide coverage of wound pathogens without the risk of inducing resistant strains of organisms.
3. Ps. pyocyaneus, particularly present in burns, is completely inhibited by polymixin, considerably reducing the healing time.
4. *Polybactrin* is not readily absorbed and there is no risk of systemic toxicity occurring.
5. The propellant gas is non-toxic and does not support combustion.
6. There are no contra-indications to the use of *Polybactrin*. Systemic therapy may be given concurrently if necessary.

FORMULA: Each pack contains: Neomycin Sulphate 750 mg. Polymixin 'B' Sulphate 150,000 units. Zinc Bacitracin 37,500 units. Propellent 83.5 g. Net contents 85 g.

POLYBACTRIN antibiotic powder spray

Supplies initially for Hospitals only—no samples available

CREWE: *Telephone: Crewe 3251-5*

CALMIC LIMITED

LONDON: *2 Mansfield Street, W.1 Tel: LANgham 8038-9*

AUSTRALIA: 458-468 Wattle Street, Ultimo. Sydney, N.S.W. **CANADA:** Terminal Building, York Street, Toronto

PI 9

ASPECTS OF A CONDITION

A twisted paper clip . . . wrenched and bent by hands that, in their restlessness, reflect the disturbed state of the mind · Covatin provides daytime sedation without hypnosis · Covatin is to be preferred to phenobarbitone in that it does not interfere with the alertness of the patient · Covatin is not habit-forming and has no side-effects · Covatin is available as 50 mg. sugar-coated tablets in bottles of 50 and 500.

Covatin

TRADE MARK

Formula: p-butylthiodiphenyl-methyl-2-dimethylaminoethyl sulphide hydrochloride

WARNER

C328/4

WILLIAM R. WARNER & CO. LTD · POWER ROAD · LONDON · W.4.

10

Between the 'up' and the 'about'

Serious illness is inevitably followed by a frustrating period of convalescence. Metatone,* with its stimulating, appetite-promoting combination of vitamin B_1 with strychnine and mineral glycerophosphates is ideally suited for the rapid restoration of normal metabolic function. It is specially valuable after 'flu and similar debilitating illnesses, after surgical operations, in neurasthenia and during pregnancy and lactation.

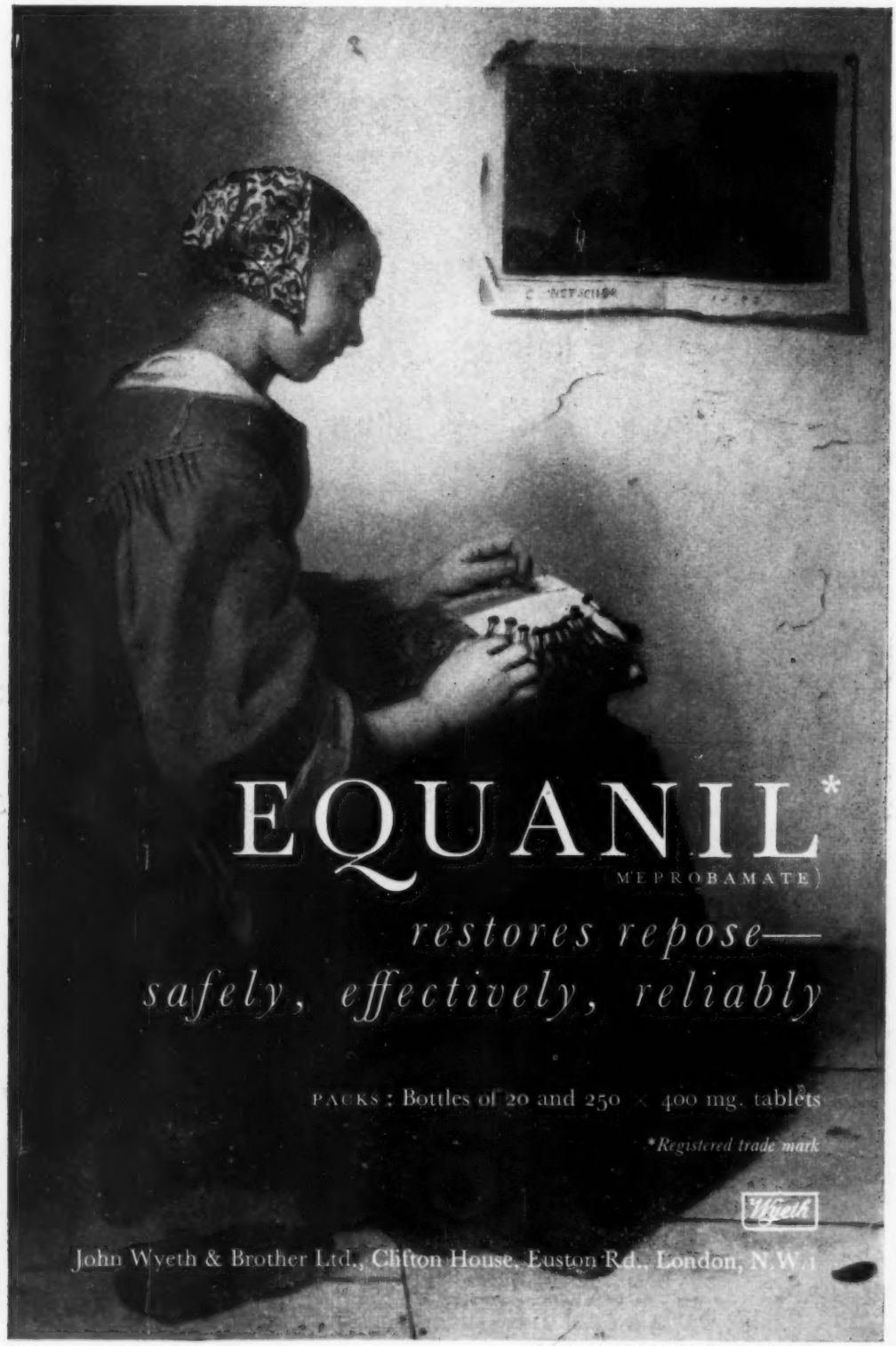
FORMULA
Each fluid ounce of Metatone contains:

Vitamin B_1	3 mg.
Calcium Glycerophosphate	4 gr.
Potassium Glycerophosphate	4 gr.
Sodium Glycerophosphate	2 gr.
Manganese Glycerophosphate	½ gr.
Strychnine Glycerophosphate	1/200 gr.

METATONE

**Trade Mark*

Parke, Davis & Co. Ltd., *(Inc. U.S.A.)* HOUNSLOW, MIDDLESEX. Telephone: Hounslow 2361
163

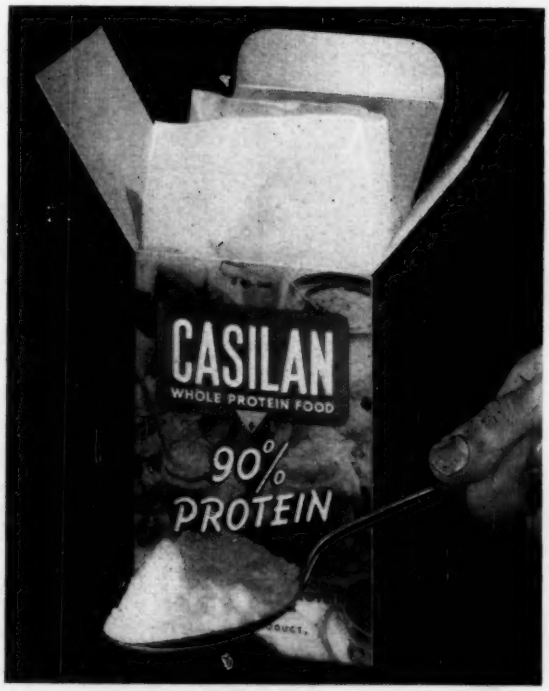

EQUANIL*
(MEPROBAMATE)
restores repose—
safely, effectively, reliably
PACKS: Bottles of 20 and 250 × 400 mg. tablets
*Registered trade mark
Wyeth
John Wyeth & Brother Ltd., Clifton House, Euston Rd., London, N.W.1

E 1 c.

Reproduced by permission of the Trustees of the Wallace Collection

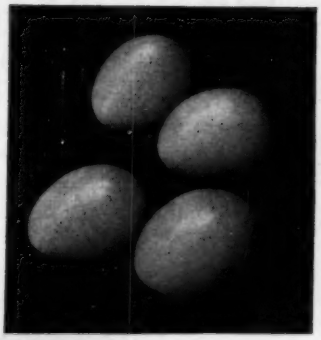
Planning a

high-protein diet



An effective, pleasing and simple way of increasing the patient's protein intake is to enrich the diet with Casilan, the whole-protein food. Effective, because every ounce of Casilan contains 90% of protein. Pleasing, because Casilan blends unnoticed into many of the foods and drinks which the patient normally enjoys. Simple, because Casilan is a powder which is easily mixed in.

Every ounce of Casilan is equivalent in protein to four eggs or 1½ pints of Milk



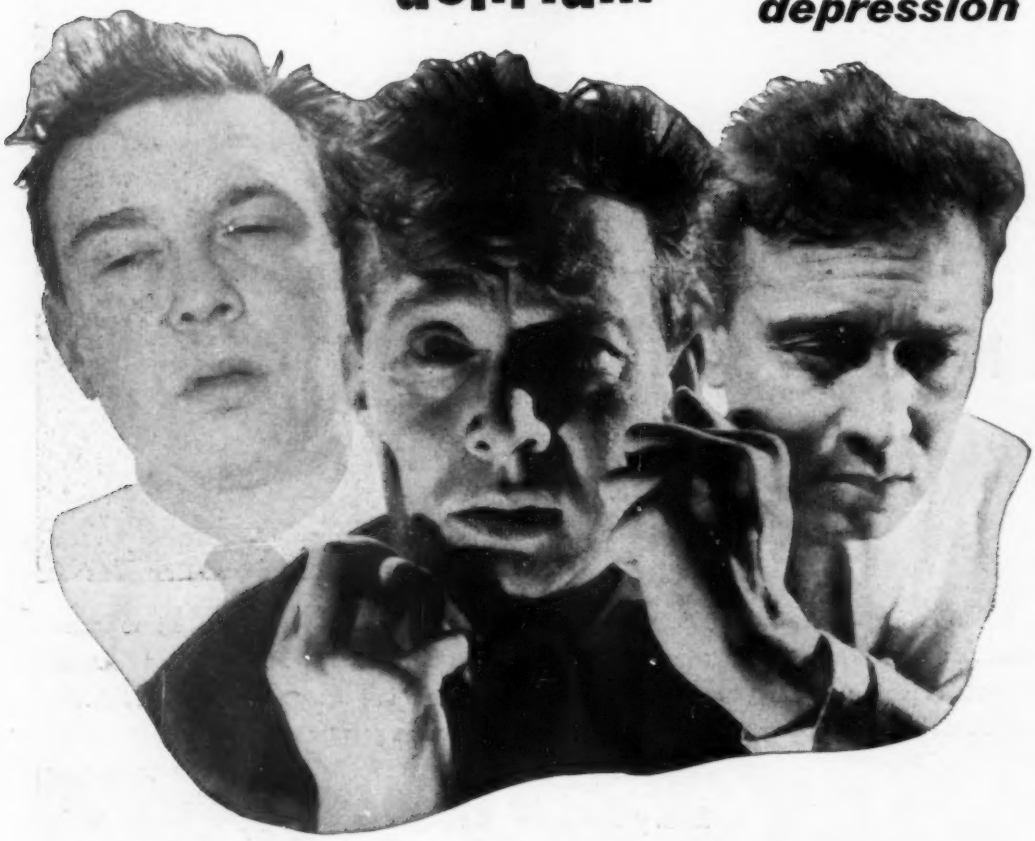
CASILAN

TRADE MARK

90% first-class protein including all essential amino-acids
In 8 oz cartons ; 40 oz tins

GLAXO LABORATORIES LTD., GREENFORD, MIDDLESEX BYRon 3434

In coma **delirium** ***depression***



PARENTROVITE

Injectable B complex with vitamin C

A massive dose of injectable B complex with vitamin C . . . to restore normal cerebral functions in toxic states due to narcotic or barbiturate drugs, alcohol, or acute infections.

In boxes of 3 pairs of ampoules. *Hospital pack also available.*

A preparation **OROVITE,** containing the same B complex vitamins in high concentration for oral administration, is also available. *In tablets and elixir.*

Two groups of preparations containing the vitamin B complex in less massive concentration are: **BECOVITE & BEFORTISS.** *In tablets, ampoules and elixirs.*

VITAMINS LIMITED (DEPT. B.2), UPPER MALL, LONDON, W.6.

The first

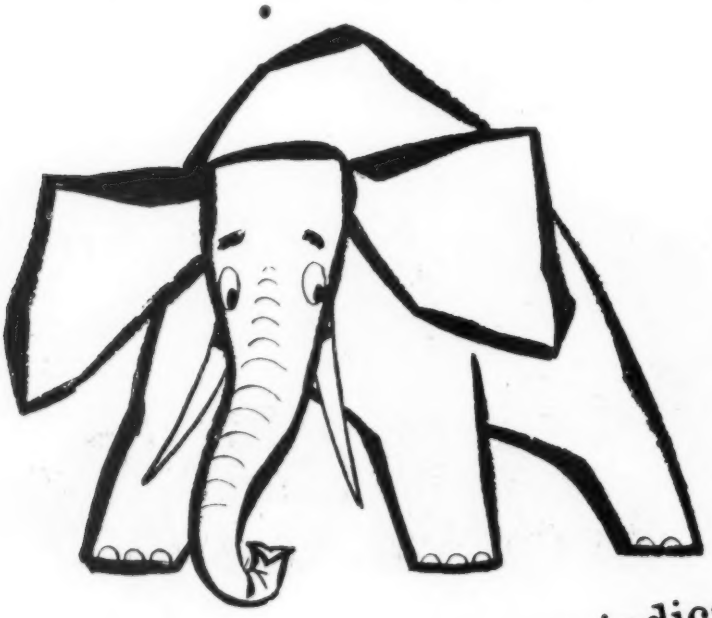
Water soluble chloramphenicol

By preparing the water-soluble sodium salt of chloramphenicol succinic ester CARLO ERBA have finally solved the therapeutic problem of parenteral (*intramuscular, intravenous, intraspinal*) and topical (*aerosol, intrabronchial, intrapleural,* etc.) administration of this antibiotic.

KEMICETINE Succinate

CARLO ERBA MILANO

CARLO ERBA MILANO



Where large doses are indicated . . .

Ce-K-Sal tablets contain soluble aspirin to provide rapid absorption without gastric irritation, with the protective Vitamin C for its detoxifying effect and value in febrile disease and Vitamin K for counteracting haemorrhagic tendencies induced by prolonged and intensive acetylsalicylic acid therapy.

FORMULA: *Each tablet contains soluble aspirin equivalent to acetylsalicylic acid 325 mg. (gr. 5), ascorbic acid (Vitamin C) 20 mg., acetomenaphthone (Vitamin K) 0.35 mg.*

Ce-K-Sal

SAFE SOLUBLE ASPIRIN

Literature and samples on request

PAINES & BYRNE LTD., PABYRN LABORATORIES, GREENFORD, MIDDLESEX

The ELECTRIC BLANKET in the TUBE

FINALGON Regd. Trade Mark
OINTMENT

Produces a glowing feeling of warmth which lasts for hours and relieves rheumatic pain

Tube of 20 g.

COMPOSITION :
Nonylic acid vanillylamide 0.4 % and Nicotinic acid-β-butoxyethyl ester 2.5 % in a suitable ointment base.
5073/E

LEWIS LABORATORIES LTD., LEEDS 9

17

ASTHMA

RYBROL

relieves anxiety

To alleviate the anxiety state so characteristic of asthmatics, Rybar Laboratories have produced a new tablet in which five ingredients combine to achieve the desired result.

Rybrol Tablets contain ephedrine which so dramatically relieves the asthmatic spasm; phenobarbitone for its sedative action; and three drugs of special value in the treatment of asthma—theophylline, dexamphetamine sulphate and phenethylamine citrate.

Rybrol is the outcome of prolonged research and specialised knowledge of the problems associated with the treatment of asthma.

Samples and further information on request.

There is a comprehensive range of efficient RYBAR remedies for ASTHMA

RYBARVIN INHALANT Non-habit forming antispasmodic for the treatment of asthma. Gives consistent and often spectacular results. Free from excess acidity and non-irritant. No side effects.

RYBAREX INHALANT Similar to Rybarvin but also has a strong expectorant action which makes it the inhalant of choice when Bronchitis and Bronchial Catarrh complicate the asthma.

NEO-RYBAREX An antispasmodic similar to Rybarex but incorporating a detergent aerosol. Particularly valuable where there is excessive or thickened secretion.

RYBRONSOL POWDER A sedative which, when taken by the mouth, soothes the general nervous system, helps to relieve the bronchial spasm and alleviates congestion in the bronchial tree.

RYBROL TABLETS A new Rybar sedative in tablet form for relieving "Anxiety State", especially in Asthma.

RYBADET AEROSOL A detergent aerosol for use in bronchiolitis and other respiratory affections associated with excessive or thickened secretion.

RYBAR INHALER Specially designed for aerosol therapy.

All products may be prescribed on E.C.10.

TANKERTON **RYBAR** LABORATORIES LTD. KENT

PB 23

SMITH & NEPHEW

Armamentarium against tuberculosis

Smith & Nephew play a prominent part in the chemotherapy of tuberculosis. They offer a range of tuberculostatic drugs which includes:—

PYCAZIDE (isoniazid) **PYCAMISAN (P.A.S. + isoniazid)**

PARAMISAN SODIUM (P.A.S.) **THERAPAS (alternative to P.A.S)**
(Calcium 4-benzamidosalicylate)

NUPASAL-213 (less toxic form of isoniazid)
(o-hydroxybenzal isonicotinyl hydrazone)

PYCAZIDE is the Smith & Nephew name for isoniazid. PYCAZIDE syrup (blackcurrant flavoured) is available to permit greater flexibility of dosage than is possible with PYCAZIDE tablets, and is particularly suitable in the treatment of children. One teaspoonful is approximately equivalent to 20 mg. of isoniazid.

P.A.S. and isoniazid are combined in **PYCAMISAN** cachets in five different strengths enabling "made to measure" dosage to be prescribed with the least waste of time and effort. PYCAMISAN cachets are practically tasteless and easy to swallow and their use offers distinct advantages in domiciliary treatment of tuberculosis.

'PARAMISAN SODIUM' is the sodium salt of P.A.S. (Sodium Aminosalicylate B.P.). It is recommended in the combined chemotherapy of all the forms of tuberculosis. It is rapidly absorbed, rapidly excreted, and of low toxicity.

The cachet form of **'PARAMISAN SODIUM'** ('PASHETS') makes oral dosage possible without any unpleasant taste in the mouth. Twelve cachets provide a day's requirements of the drug. 'PARAMISAN SODIUM' is also available in tablet form and in ampoules for local or intrathecal injection.

Wherever P.A.S. is indicated **THERAPAS** may be used. It is better tolerated by the patient and has a slightly sweet, not unpleasant taste. THERAPAS is as effective as P.A.S. in delaying the emergence of streptomycin resistance. Its value in the treatment of genito-urinary tuberculosis is well established.

As an alternative to isoniazid **NUPASAL-213** may be used in cases which have already exhibited toxicity to isoniazid, for the toxicity of NUPASAL-213 is virtually nil.

Dosages and presentations of any or all of these drugs will gladly be sent on request as space does not permit those details to be given in this advertisement.

S&N **SMITH & NEPHEW LTD · WELWYN GARDEN CITY · HERTS**

CALADRYL* provides quick and easily applied relief for irritating skin conditions. Combining the anti-pruritic and anti-allergic effects of Benadryl with the soothing mild astringency of calamine, CALADRYL LOTION, a smooth non-greasy liquid, promptly alleviates the discomfort of urticarial conditions, as well as measles and chicken pox rashes. CALADRYL CREAM, a similar formula in a water-miscible cream base, is an effective means of counteracting chapping and skin soreness due to wintry weather.

* *Trade Mark*

CALADRYL

LOTION In bottles of 4 and 80 fluid ounces

CREAM Tubes of approx. 1½ ounces and jars of 1 lb.

Parke, Davis & Company, Ltd. (*Inc. U.S.A.*) Hounslow · Middlesex · Tel: Hounslow 2361

345

THE NEWEST,
MOST POTENT,
CORTICOSTEROID

Deltacortril*

BRAND OF PREDNISOLONE

A MORE POTENT SYNTHETIC STEROID

Deltacortril, brand of prednisolone, is a new synthetic steroid which offers superior treatment in rheumatoid arthritis, asthma and certain dermatoses. It is three to five times more potent than hydrocortisone or cortisone in systemic therapy and more effective than prednisone.

IMPROVED RESPONSE

Deltacortril brings faster and more prolonged response in chronic rheumatic conditions, easing joint pain, diminishing stiffness and producing a distinct feeling of well-being in a matter of hours.

LOWER DOSAGE

Deltacortril produces the greatest anti-arthritic, anti-allergic, and anti-phlogistic effect at fractional dosage.

GREATER SAFETY

Deltacortril, despite its intensified potency, is relatively free from side-effects.

DELTACORTRIL will be available for prescription on E.C.10 on the 1st February, 1957. Tablets of 1 mg. will be available in bottles of 100, and scored 5 mg. tablets in bottles of 10, 20, 100, 500 and 1,000.

Pfizer *Pfizer Ltd., Folkestone, Kent*

*Trade Mark of Chas. Pfizer & Co., Inc.

℞ DQV

The easily written, easily remembered contraction for

Acid-Stable ORAL Penicillin

'Distaquaine' V

trade mark

Crystalline penicillin V, free acid

DQV TABLETS	DQV ELIXIR	DQV SULPHA
Each tablet contains 60 mg. penicillin V Bottles of 30, 200 and 1000	Each dose (½ fl.dr.) contains 30 mg. penicillin V Bottles of 2 fl. oz. (30 doses)	Each tablet contains 60 mg. penicillin V 0.30 gm. sulphadimidine 0.14 gm. sulphamerazine Bottles of 30, 200 and 1000

DOSAGE

Adults: 60 mg. or more every four hours
Children: Half the adult dose

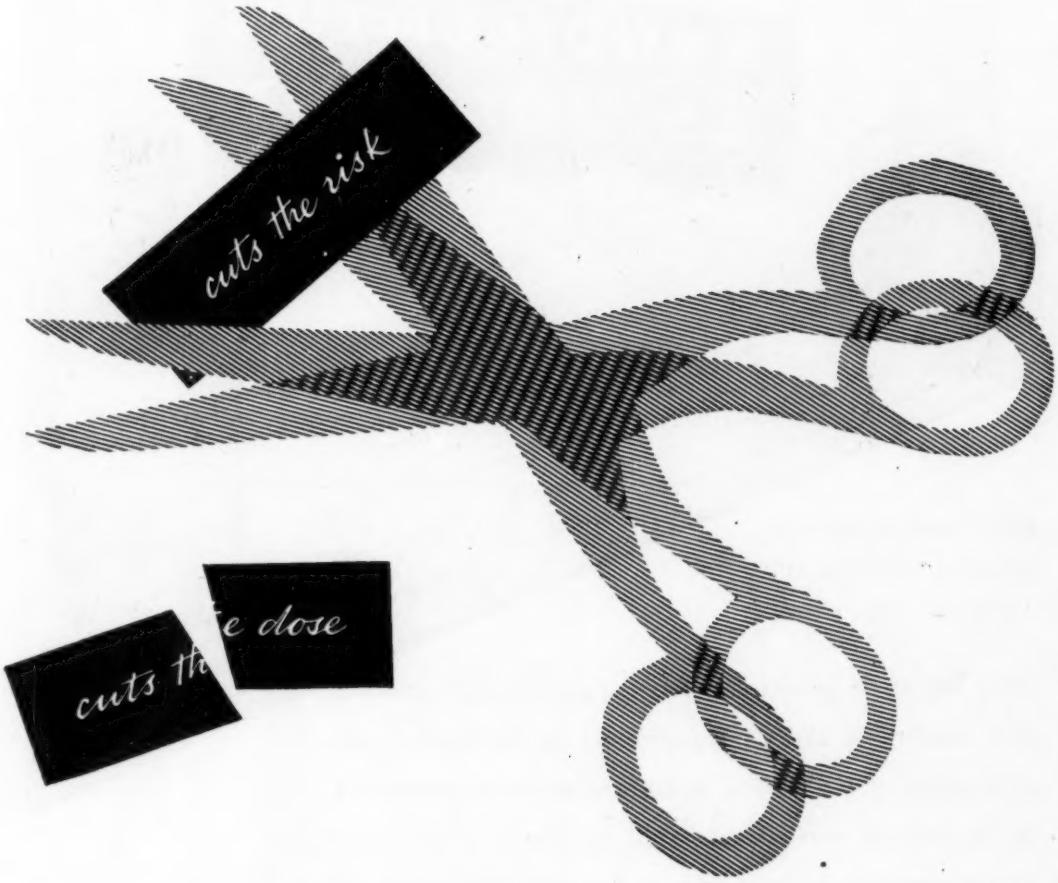
Manufactured by

THE DISTILLERS COMPANY *(Biochemicals)* LIMITED

SPEKE, LIVERPOOL 19 *Tel:* HUNTS CROSS 1271

owners of the trade mark 'Distaquaine'

PPH 30/56



Freely Prescribable from February 1st

CORDEX*

Prednisolone + Acetylsalicylic Acid

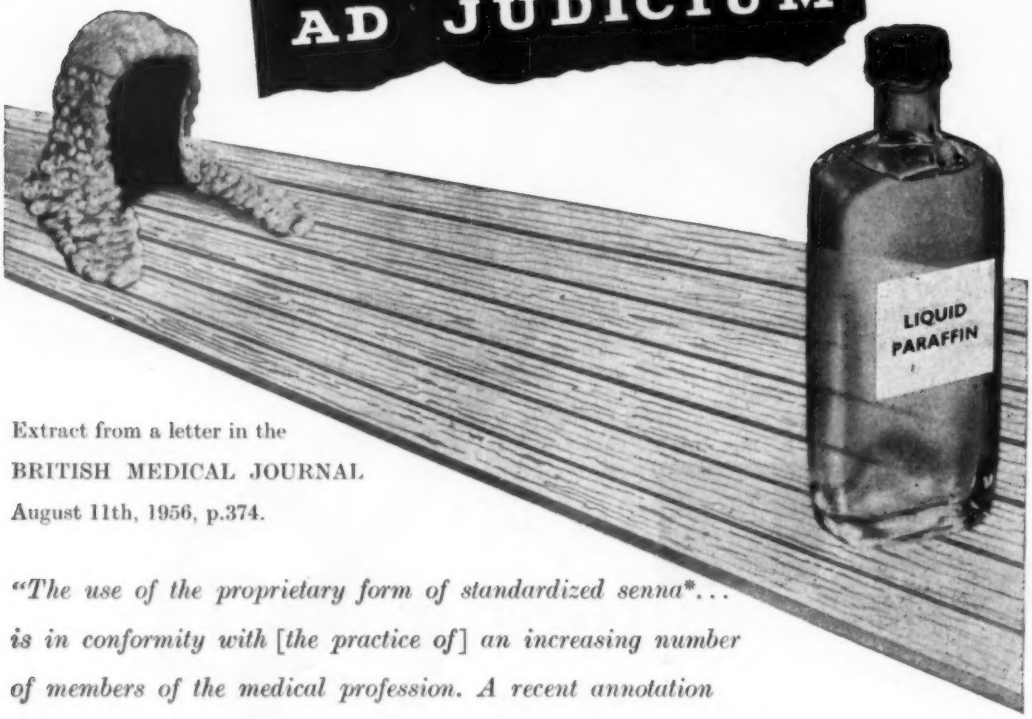
* trademark

for the mild to moderate
rheumatic conditions encountered in general practice

Upjohn

Upjohn of England Ltd · 4 Aldford Street · London W1

ARGUMENTUM AD JUDICIUM



Extract from a letter in the
BRITISH MEDICAL JOURNAL
August 11th, 1956, p.374.

"The use of the proprietary form of standardized senna... is in conformity with [the practice of] an increasing number of members of the medical profession. A recent annotation in the Journal incriminates liquid paraffin as a cause of lipoid pneumonia and as an obstacle to the absorption of fat-soluble vitamins . . . and to the healing of wounds. In these days of economy in prescribing . . . the biologically standardized form of senna . . . is cheaper by half than paraffin, is far easier to dispense, and there is no wastage of storage space."*

* Senokot — the only standardized, fully active preparation of senna.
Re-educative and curative in chronic constipation.

℞ Senokot

STANDARDIZED SENNA

	BASIC N.H.S. PRICES (*Tax free D.P.s*)	RETAIL PRICES (*Including Tax*)
GRANULES:	2 lb, 18*d*	2 oz, 2/7; 6 oz, 7/3
TABLETS:	1000, 14*d*	50, 2/1; 200, 6/9

Freely prescribable on E.C.10 (Category 3, J.C.P); no B.P. equivalent; not advertised to the public.

WESTMINSTER LABORATORIES LTD., CHALCOT RD., LONDON, N.W.1
G372

proving the potential of

DIAMOX*

ACETAZOLAMIDE

in cardiac oedema

New Eng. J. Med. (Feb. 3) 1949.
New Eng. J. Med. (July 23) 1953.
J. Med. Soc. N. Jersey (Nov.) 1954.
El Dia Medico (Feb. 14) 1955.

in glaucoma

Am. J. Ophthal. (Jan. and July) 1954.
Brit. J. Ophthal. 39:647, 1955.
Lancet, 1:951, 1955.
Editorial Article, *Brit. Med. J.*, 2:479, 1955.

in oedema of pregnancy

Am. J. Obstet. and Gynec., 56:1, 1948.
Proc. R. Soc. Med., 46:396, 1953.
Lancet, 2:1223, 1955.
N. Carolina Med. J., 16:4:130, 1955.

in epilepsy

Neurology, 4:863 (Nov.) 1954.
J.A.M.A., 160:268, 1956.
Lancet, 1:304 and annotation 273, 1956.
Brit. Med. J., 1:650, 1956.

DIAMOX Acetazolamide, in these and many other conditions, stands distinguished as the diuretic of proven effectiveness. So convincing is the documentary evidence, that today no practitioner will lightly disregard the potentialities of DIAMOX.

A digest of clinical evidence on DIAMOX is available to all doctors in a new Lederle book entitled "DIAMOX 1956."

TABLETS:
DIAMOX Acetazolamide Tablets of 250 mg. (engraved). Bottles of 25, 100 and 1,000.

PARENTERAL:
DIAMOX Acetazolamide Sodium Parenteral 500 mg. Vials of 500 mg.

**Regd. Trade Mark*

LEDERLE LABORATORIES DIVISION
Cyanamid PRODUCTS LTD. **LONDON, W.C.2**

25

PREDICTABLE *ANTACID THERAPY*

PRODEXIN

1 **rapidly relieves gastric pain**
2 **safely buffers excess acid**
3 **non-alkalising**
4 **non-constipating**
5 **stable, consistent and predictable**

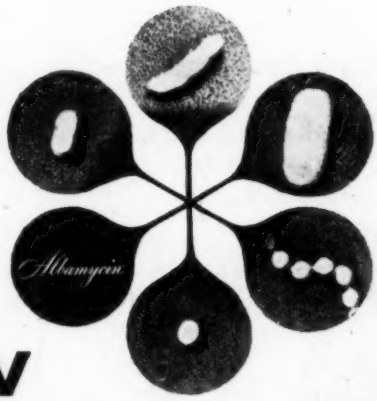
Prodexin tablets provide the advantages of alumina buffer therapy without its disadvantages. The tablets are pleasant to take and when slowly sucked provide antacid control comparable with that obtained by drip therapy. **Prodexin**, however, unlike milk-alkali regimes, does not aggravate acid secretion.

PRODEXIN
Dihydroxy aluminium aminoacetate...0·9 gm.
Magnesium carbonate.....0·1 gm.

Cartons of 30 singly wrapped tablets.

Dispensing packs of 240 tablets (basic N.H.S. cost 30/4d.)

C. L. BENCARD LTD · PARK ROYAL · LONDON · N.W.10



NEW

powerful bactericidal action against "frequent offenders"

Bactericidal against gram-positive and certain important gram-negative organisms, Albamycin has a range of activity which includes the following "frequent offenders": staphylococci (including "resistant" strains), streptococci, pneumococci, proteus and certain strains of pseudomonas organisms.

orally effective

*Albamycin**

(brand of novobiocin)

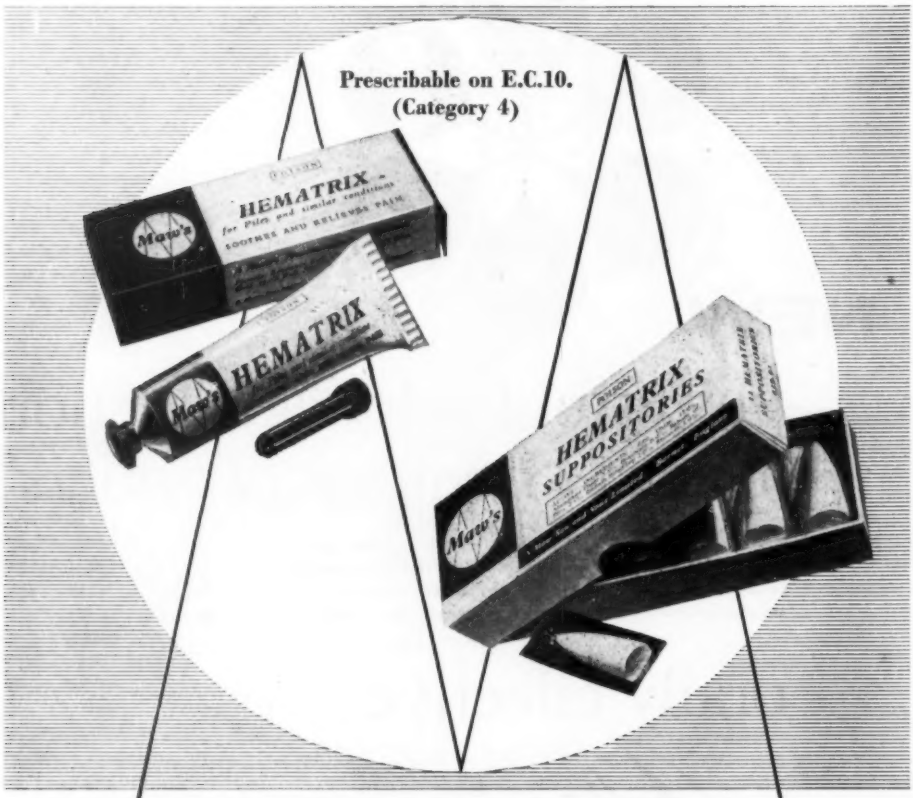
WELL TOLERATED

blood concentrations 10 to 50 times higher
than with other antibiotics + retention in the body
for as long as 24 hours = prompt clinical response
in many common infections *on 2 doses daily*

ADULTS — *500 mg. every 12 hours.*
CHILDREN — *15 mg./Kg. of body weight per day, usually in two equal doses.*
SUPPLIED *250 mg. tablets, bottles of 16 and 100.*

NOW RELEASED TO HOSPITALS

Upjohn **UPJOHN OF ENGLAND LTD • 4 ALDFORD STREET • LONDON W1**



For the treatment of haemorrhoids, pruritus ani, and inflammatory eczematous lesions in the anal region.

Hematrix Ointment

HEMATRIX is designed for the immediate relief of itching and localised pain through progressive treatment of the enlarged and varicose tissues by mild antacid astringent action. HEMATRIX acts promptly, effectively and thoroughly, promoting the disappearance of subjective symptoms.

Hematrix Ointment is presented in a tube with an applicator for internal use, and contains:

BENZOCAINE	6%
ALUMIN. OXIDE	7·5%
ZINC OXIDE	15%
BALSAM PERU	2·5%

Hematrix Suppositories

An alternative method with the inclusion of Bismuth Subgallate and Resorcin in the formula gives added value in pruritus and sepsis. Also gives maximum relief from pain and itching.

The distinctive straight-sided, conical shape is selected for giving prolonged contact with the anal canal, and greatest ease of insertion. The more gradual displacement of the orifice so permitted is of marked benefit where fissure is present.

Each suppository is plaquetted in transparent acetate and supplied in boxes of 12.

Maw's

S Maw Son and Sons Limited Barnet England

NOW POSSIBLE!

INCREASED SAFETY

AND EFFICIENCY WITH

HYDROMYCIN

IN THE TREATMENT OF INFLAMMATORY SKIN CONDITIONS

HYDROMYCIN by combining the anti-inflammatory properties of Hydrocortisone with the anti-bacterial properties of Neomycin offers increased safety over the use of Hydrocortisone alone. HYDROMYCIN is ideal in the treatment of contact dermatitis, atopic dermatitis and non-specific pruritus.

SKIN OINTMENT	*Tubes of 5G and 15G*
EAR/EYE OINTMENT	*Tubes of 3G*
EAR/EYE DROPS	*Bottles of 3ml.*

THE FULL RANGE OF BOOTS BRITISH-MADE CORTICOSTEROIDS

CORTISTAB (Cortisone Acetate) Tablets, Injection, Eye Drops, Eye Ointment.
HYDROCORTISTAB (Hydrocortisone) Tablets, Local & Intravenous Injections, Skin Ointment, Eye Ointment, Eye Drops, Cream.
DELTA-STAB (Prednisolone) Tablets.
Delta-stab Tablets are at present available through N.H.S. hospitals only by arrangement with the Ministry of Health.

BOOTS PURE

Literature and further information gladly sent on request:
DRUG COMPANY LIMITED, NOTTINGHAM

Boots

The Roche antibiotic is now available

'ROMICIL'

TRADE MARK BRAND

OLEANDOMYCIN

Highly active against a wide range of pathogenic organisms, *'Romicil' does not disturb the normal bacterial flora of the gastro-intestinal tract.*

'Romicil' is easily absorbed, and high concentrations are obtained in the tissues; it is well tolerated, and is not destroyed in the alimentary tract.

Dosage: ***Children.*** 3 mg. to 5 mg. per pound body-weight every six hours. These doses can most conveniently be given by using the 100 mg. capsules.

Adults. Initial dose 500 mg. to 1000 mg., followed by 250 mg. to 500 mg. every six hours.

Packings: **Capsules 100 mg. in packings of 12 and 100.**
Capsules 250 mg. in packings of 12 and 100.

ROCHE PRODUCTS LIMITED, 15 MANCHESTER SQUARE, LONDON, W.1

Now you *can* choose . . .

CORTELAN (cortisone Glaxo)

EF-CORTELAN (hydrocortisone Glaxo)

DELTA-CORTELAN (prednisone Glaxo)

DELTA-EF-CORTELAN (prednisolone Glaxo)

Which *do* you choose . . . ?

You may find this a difficult decision to make, now that prednisone and prednisolone can be prescribed in general practice. The following are the main points to consider for, and against, the delta-derivatives of cortisone before making your choice.

FOR

Prednisone and prednisolone are about four times as active as cortisone weight for weight, and they are less liable to cause salt and water retention.

AGAINST

The delta-derivatives are more costly. Less flexible in use. Are reported to cause gastric upset more often.

When to use them

If the patient requires long-term cortico-steroid treatment at high dosage levels.

DELTA-CORTELAN Trade Mark

(prednisone Glaxo)

DELTA-EF-CORTELAN Trade Mark

(prednisolone Glaxo)

Scored tablets of 5 milligrams in bottles of 30, 100 and 500

GLAXO LABORATORIES LTD., GREENFORD, MIDDLESEX BYRon 3434

Makers of **ALL** you need for cortico-steroid treatment

PENTOXYLON

COMPREHENSIVE THERAPY FOR ANGINA PECTORIS

- **Prevents coronary spasm**
- **Averts attacks**
- **Dispels fear**

PENTOXYLON *Complete Angina Therapy*

- * *reduces nitro-glycerin requirements.*
- * *reduces severity of attacks.*
- * *reduces incidence of attacks.*
- * *reduces tachycardia.*
- * *reduces anxiety, allays apprehension.*
- * *reduces blood-pressure in hypertension.*
- * *increases exercise tolerance.*
- * *produces objective improvement demonstrable by electro-cardiograph*

— it is recognised — would not only relieve the coronary spasm, but would help to prevent attacks. This has been accomplished by 'Pentoxylon' to a considerable degree. 'Pentoxylon' combines the benefits of two powerful and reliable agents — 'Rauwiloid' and P.E.T.N. 'Rauwiloid', an alkaloidal extract of *Rauwolfia serpentina*, has bradycardic, tranquillising and stress-relieving properties, and stabilises the patient emotionally. P.E.T.N. produces a long-sustained dilatation of the coronary blood vessels, so improving the circulation to the myocardium, reducing the severity of attacks when they occur. The dual action of 'Pentoxylon' provides a more comprehensive . . . more effective . . . therapy than has hitherto been possible using a single medicament, and it infuses the anginal patient with a feeling of well-being and hope.

Each 'Pentoxylon' tablet contains 1mg. 'Rauwiloid' and 10mg. pentaerythrityl tetranitrate. The usual dosage is one tablet four times daily *before* meals. Occasionally it is desirable to increase the dosage — up to 8 tablets daily are well tolerated.

RIKER

'Pentoxylon' is a regd. trademark. Regd. users.

RIKER LABORATORIES LIMITED
LOUGHBOROUGH LEICS.

Looking at two aspects—

Whether sedative or expectorant therapy is required in the management of cough, appropriate selection may be made from Allen & Hanburys outstanding cough preparations—ETHNINE, a sedative elixir, or PIRIEX, an expectorant Linctus.

ETHNINE, a palatable and effective cough sedative containing pholcodine is rapidly replacing preparations of codeine in the suppression of exhausting and harmful unproductive cough in children, adults and elderly patients.

The advantages of Ethnine are in its effectiveness with low toxicity, and its freedom from side-effects such as constipation and digestive upset.

For sedative cough therapy

ETHNINE

Trade Mark

Bottles of 4 and 80 fluid ounces containing 4 mg. pholcodine in each teaspoonful (4 c.c.)

PIRIEX, a carefully chosen combination of an improved antihistamine of low toxicity with expectorants, is unsurpassed in therapeutic activity where a stimulant expectorant linctus is indicated.

Piriex effectively liquefies tenacious sputum and aids its prompt removal. It is also an effective decongestant and is invaluable in the treatment of congestion of the upper respiratory tract.

For expectorant therapy

PIRIEX

Trade Mark

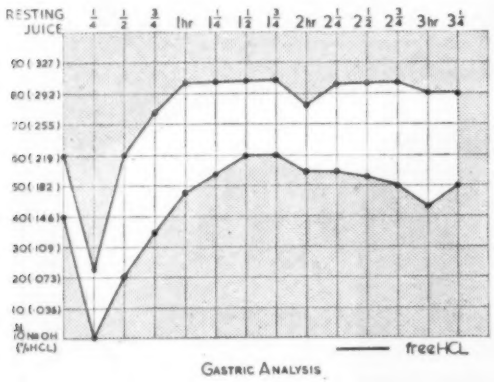
(Formerly known as Piriton Expectorant Linctus.)

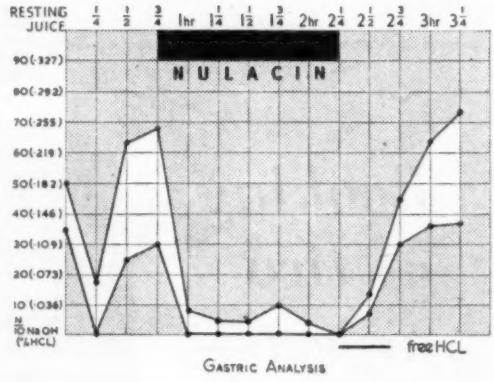
Bottles of 4 fluid ounces and 2 litres containing 2 mg. Piriton in each teaspoonful (4 c.c.)

C56/436/437.H

ALLEN & HANBURYS LTD · LONDON · E·2

TELEPHONE BISHOPSGATE 3201 (20 LINES) TELEGRAMS GREENBURYS BETH LONDON





In the treatment of peptic ulcer— safe, simple, effective, without side effects

NULACIN

provides milk-alkali drip therapy

A most effective control of gastric acidity is by milk-alkali drip therapy ; the most convenient way of obtaining milk-alkali drip therapy is by sucking Nulacin tablets.

peptic ulcer in the ambulatory patient

Nulacin is of great value in the treatment of peptic ulcer in the ambulatory patient, and in the prevention of ulcer relapse.

clinical trials in three continents

Extensive clinical work has confirmed the claims made for Nulacin. References to some studies appear below. Other references will be given on request.

Nulacin tablets are not advertised to the public, have no B.P. equivalent and may be prescribed on E.C.10. The dispensing pack of 25 tablets is free of purchase tax. Basic price to N.H.S. is 2/-. Also available in tubes of 12.

Nulacin is available throughout the British Commonwealth, in the U.S.A., and in many other countries. It is known as Nulactin in Canada and Sweden.

HORLICKS LIMITED

Pharmaceutical Division, Slough, Bucks.

SELECTED REFERENCES

Antacids, *The Practitioner*, January, 1957, **178:** 43

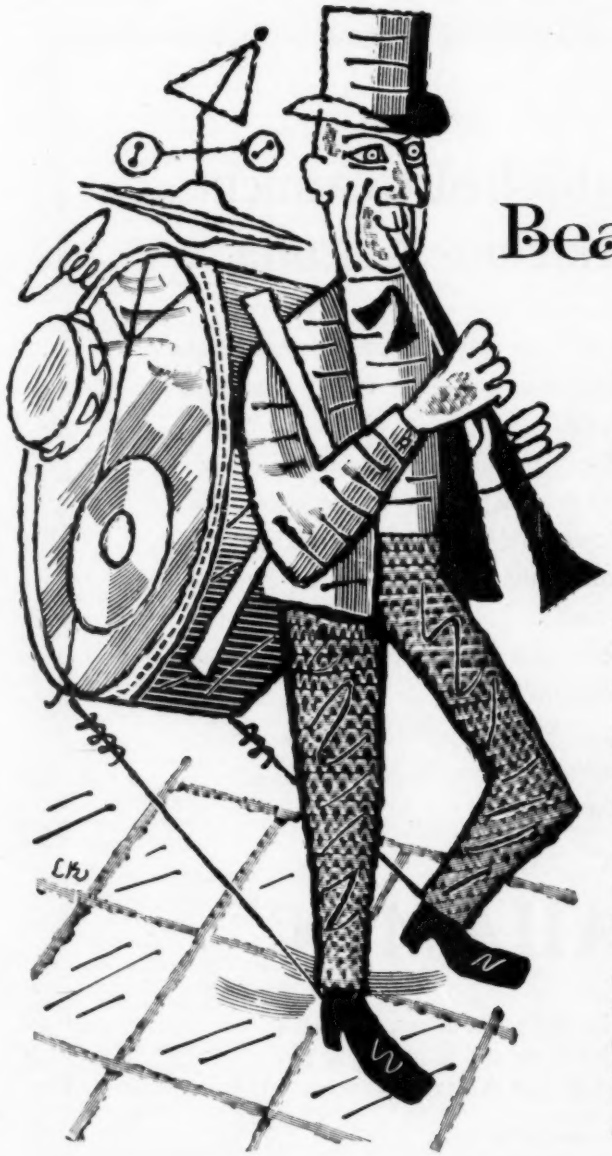
Antacids in Peptic Ulcer, *The Practitioner*, January, 1956, **176:** 103

Ambulatory Continuous Drip Method in the Treatment of Peptic Ulcer, *Amer. J. Dig. Dis.*, March, 1955, **22:** 67-71

Further Studies on the Reduction of Gastric Acidity, *Brit. Med. J.*, 23rd January, 1954, **1:** 183-184

Clinical Investigation into the Action of Antacids, *The Practitioner*, July, 1954, **173:** 46

The Control of Gastric Acidity, *Brit. Med. J.*, 26th July, 1952, **2:** 180-182



Beats the lot

'CORTISPORIN' kills the bacteria of surface infections

This new ointment contains bacitracin, neomycin and polymyxin B sulphate. It has a wider range of activity than any single antibiotic, destroying gram-positive and gram-negative organisms, including *Ps. pyocyanea, proteus* and staphylococci. Bacterial resistance or skin sensitisation are unlikely with 'Cortisporin'; nor does it induce cross-resistance or cross-sensitisation to penicillin or other antibiotics. It often succeeds where other antibiotics fail.

'Cortisporin', by virtue of its other constituent, hydrocortisone, also reduces inflammation.

For further information please apply to BURROUGHS WELLCOME & CO., The Wellcome Building, Euston Road, London, N.W.1.

'Cortisporin' BRAND OINTMENT

Issued in collapsible tubes of 10 gm. with nozzle for economical use.

BURROUGHS WELLCOME & CO. *(The Wellcome Foundation Ltd.)* LONDON

The Established treatment for Pernicious Anæmia

Clinical experience over 20 years has proved that regular administration of Anahæmin is a totally effective treatment for Pernicious Anæmia.

Anahæmin produces a prompt and satisfactory erythropoiesis in patients in relapse, it ensures the maintenance of a normal erythrocyte level in patients in remission and is effective in preventing the onset of subacute combined degeneration of the cord.

Anahæmin has been used and reported to be beneficial in the following conditions :

- Herpes Zoster and Post Herpetic Neuralgia
- Tropical Nutritional Macrocytic Anæmia
- Post partum Syndrome

'ANAHÆMIN'

1 ml. ampoules, Boxes of 6 at 11/4, 25 at 43/4
2 ml. ampoules, Boxes of 6 at 19/-, 25 at 74/-
Vials of 10 ml. at 14/8 and 25 ml. at 35/10

Basic N.H.S. prices

Literature and specimen packings are available to members of the Medical Profession on request

Medical Department

THE BRITISH DRUG HOUSES LTD. LONDON N.1

ACNE VULGARIS *

R. M. B. MACKENNA
M.A., M.D. Camb., F.R.C.P.
PHYSICIAN IN CHARGE OF THE DEPARTMENT OF SKIN DISEASES, ST. BARTHOLOMEW'S HOSPITAL, LONDON

IT may be thought presumptuous to lecture, in the Royal College of Physicians, on acne vulgaris. I may well be reminded that, because the malady often is painless and does not cause itching, the earlier Greek and Roman authors scarcely mentioned it in their writings—cf. Hebra (1868): also the Medical Works of Hippocrates, translated by Chadwick and Mann (1950), in which I can find no reference to the malady—and that I would be better advised to follow the example of our ancient preceptors and confine my attention to some more serious topic.

My motive, however, is based on the following considerations: firstly, a certain amount of important work concerning acne vulgaris lies buried and forgotten—by all but a few—in the vast literature of the subject; secondly, errors have crept into dictionaries, medical histories, and even textbooks, and are likely to be perpetuated by those who have neither time nor opportunity to refer to original sources; thirdly, some old and much modern work requires collation; and fourthly, acne vulgaris is a subject which such British dermatologists as Willan and Bateman (1813), Plumbe (1824), and Erasmus Wilson (1842) studied: therefore, from the traditional aspect, it is not inappropriate for one who, however unworthily, follows in their footsteps, to solicit your interest in this malady. In fulfilling my task I hope to give not merely a clinical account of acne vulgaris but an epitome of the disease itself and matters appertaining to its study. I shall use the single word "acne" to denote acne vulgaris—a name which probably was first coined by Fuchs and accepted after the publication of his textbook in 1840. (In this work Fuchs uses the names acne vulgaris, acne vulgaris simplex, and acne vulgaris indurata.)

Etymology and Philology

The origin of the noun is obscure; certainly it was not derived from the Romans, for they named the malady *varus*; to the classical Greeks, the lesions of acne were *ionthoi*. Grant (1950) noted that in the Ebers Papyrus and elsewhere in Egyptian literature, the word *aku-t* was used to denote boils, pimples, and pustules. He suggested that possibly the Greeks, who dominated Egypt during the last three centuries before Christ, accepted *aku-t* as a loan-word, so that later it was spoken in Greece as a word resembling "acne" or "acme." This ingenious suggestion—which implies that the first syllable of acne has come echoing down the corridors of time—is very attractive, but I am advised by a philologist that it is not acceptable: he considers that if the Greeks adopted the word they would have shortened it to *aku* and not substituted a suffix.

The first recorded use of the word acne is in the works (*Tetrabiblion* and *De Re Medica*) of Ætius (circa A.D. 542) who was physician to Justinian the Great at Constantinople; but Ætius appears not to have coined the word; he used it as an accepted term, spelling it *acnæ* (only once, in the Frankfurt edition of his work, is it spelt *acmæ*). Ætius gives no reference to the origin of the word or the reasons for its use (Grant 1951a). Gorræus (1564) thought that acne was derived from the Greek *a* and κνῆσις meaning "without itch" (Grant 1951a). Cazenave (1838) mentioned a derivation from *akne* or *akun* meaning "a point," but I suspect (although I have failed to trace him) that some earlier worker was responsible for this suggestion. I am advised that all these explanations are subject to criticism. If the word is derived from the negative *a*—and the root *knao*, it can only be an ancient adjectival formation, which survived in speech and eluded literary use until the 6th century A.D.

It seems churlish after the interest he has shown, but I refrain from quoting several long and erudite comments on the possible derivation of the word acne with which a friend who is a professor of Greek has furnished me; I hope that he and his philological colleague will publish them later. All I can say is that, despite the dogmatic statements which for many years have been printed in textbooks both at home and abroad there is no certainty concerning the origin of the word.

Although Ætius used *acnæ* about 542 A.D., the noun was but slowly accepted (cf. Hebra 1868), and until comparatively recent times many medical writers used the term varus.

Acne, of course, involves the sebaceous glandular system, and (because others have been given the credit) it is worth noting here that Antonio Maria Valsalva (1707), famous for his investigations on the structure and physiology of the ear, first described a number of glands in the skin of the auricle, and named these *glandulæ sebaceæ* because they separate a greasy matter, like tallow or suet. This sebum, he asserted, being carried to the surface of the skin, turns into a scaly substance, not unlike bran (cf. Chambers 1738). Those who study seborrhœic dermatitis might like to consider the possible implication of this statement. Earlier M. Malpighi (1628–94) and Niels Stenson (or Nicolaus Steno) of Copenhagen (1638–86) noted the sebaceous glands, and probably were the first to do so, but Valsalva must have the credit for giving them the name we recognise; incidentally, it was in an epistle to the Royal Society that Malpighi dealt most fully with these glands and with the epidermis. Malpighi merely referred to conglobate glands in the skin having ducts to the surface: Stenson, in an account of a dissection of the head of a dog, referred in 1667 to pores from which a viscid unctuous humour oozed; these he regarded as excretory channels of the skin.

The latin noun *sevum* (or *sebum*), suet or tallow, has an honest origin in the writings of Plautus and other Latin authors. One has only to know that there was a latin verb *sevo*, to grease or to tip in tallow, and an adjective *sevosus* meaning greasy or full of tallow, to be assured about the adjective "sebaceous." Fuchs (1840) is usually given the credit for constructing the word "seborrhœa." Actually he used the word "seborrhagia" as a synonym for *der Gneis*, and referred to seborrhœas as seborrhöen; I have not found any notes in his book concerning the etymology of these words, although it is widely believed that he derived them from *sebum* and *rheo*, to flow. Dermatologists who wrote in English seem to have been reluctant to use the word sebum. "Sebaceous substance" was the term used by Erasmus Wilson as late as 1878. Ten years later Radcliffe Crocker (1888) mentions "sebum" in his book although it does not appear in the index. In America, L. A. Duhring refered to "sebaceous matter or sebum" in his *Practical Treatise* (1876) and included "sebum" in his index. Since then the drive against pleonasm has ensured the acceptance of this word.

Lastly we must study the etymology of the noun comedo.

Very briefly—for the subject could be used for a monograph—we may note that Bateman (1813) stated that the "black points" of acne were vulgarly considered as the extremities of small worms or grubs. Even as late as 1846, Hoefle of Heidelberg noted that it was widely believed by the laity that blackheads were worms

* The Watson Smith lecture, delivered before the Royal College of Physicians of London on Jan. 10, 1957.

which, if present in large numbers, sapped nutritious material from their hosts and caused cachexia (Hoefle 1846). Hence, I suggest, the use of the name comedo, which is Latin for a glutton. The German name *Mitesser*, which implies "that which feeds on one," must have a similar etymology. Many standard Latin-English dictionaries give the verb *comedere*, to eat up, consume, devour, or squander: only a few mention the noun, stating that it was employed by the authors Lucilius, Varro, and J. Paulus. The earliest medical references appear to be those of Velschius (1674), Eyselius (1711), and Lentinn (1711). According to Hoefle, Velschius records the opinion of many earlier doctors, some of whom believed that comedones were living animalculæ, some a disease of the hair, and some that they were dyscrasic deposits. One, Werner Rolfink, believed that the expressed matter of comedones was actually a viscous excrement of the skin condensed in the pores; in this respect Rolfink was evidently many years ahead of his time.

The word *crinones* keeps cropping up in the literature: it is a Low Latin word for moustache hairs, and Astruc (1746), quite erroneously I think, states that German writers, through a corruption of the word *crinones*, called the lesions comedones. But it is very debatable whether the lesions named crinones, or *Mitesser*, or comedones, by these earlier writers were lesions of acne, for there are continual references to their appearance in infants. Possibly comedones were more common in infants in those days; but I shall refer to this later.

I am uncertain when the word comedo was first used in the way that we employ it. Plumbe did not use it in 1837, but in 1840 Fuchs devoted a section of his book to comedones. I suspect that either between these two dates the noun "comedo" was generally accepted as a medical term having the meaning that we understand today, or else that Fuchs was responsible for its acceptance.

Historical Notes

In studying a disease such as acne, it is of some interest to know the dates when the major ætiological concepts that are now recognised as being important were originally noted, and the dates when the major heresies which persist to this day first arose; it is convenient also to know where one may look for general data.

Grant (1951a) has suggested that, because *ionthoi* meant acne, and *ionthus* the first growth of secondary sexual hair, the Greek physicians 2500 years ago recognised a relationship between the disease and the event.

Possibly the Romans recognised a familial tendency to the malady; Hebra (1868) quotes Cicero's jest (based on a pun) made at the expense of C. Servilius Isauricus "We wonder why your father Servilius, a most constant man, bequeathed nothing but acne to you."

With regard to an association between endocrine activity and acne, Grant (1951a) found that Riolanus (1638) noted an association between the eruption and disorders of menstruation: also that Jonston (1648) had noted a relationship between virility, repression, and acne: "Vari . . . infect young people that are inclined to venery and fruitful, but chast withal and continent." Plenck (1783), whose small book, despite its international fame, can, from its construction, be regarded as the first synopsis of, or even "cram-book" in, dermatology, published a dictum which, although Hebra disagreed with it, has profoundly influenced medical opinion: "Matrimony cures vari" (in parenthesis we may note that Sulzberger and Baer [1949] have not found any proof that coitus improves acne). Plenck also said, "acne is of common occurrence in young people who live on a rich diet and who secrete plenty of semen; it disappears in the later teens."

Fifty years later Rayer (1835) noted that dysmenorrhœa was sometimes associated with acne in girls and young women. He also stated that acne sometimes develops in young people who practise onanism: Hebra (1868) disagreed with this—so, later, did Sulzberger and Baer (1949)—but that onanism causes acne is a belief that has been widely held, particularly by schoolmasters.

Finally, as far as the endocrine basis for acne is concerned, the widely accepted statement, confirmed by Hamilton (1941), that eunuchs do not develop acne, seems to originate from a personal communication to Hebra (1868) from Professor Rigler (who lived for 12 years in Constantinople): "I very rarely saw acne in eunuchs."

Indirectly, Hebra may have been responsible for the advice which is still given, and which often has led to irreparable disfigurement from scarring, "Don't bother to treat acne, the lesions disappear when the patient gets older"; for Hebra, with strange inconsistency, wrote, *tempus varos curat*, although on an earlier page in his book he had written "there are persons who suffer from acne all their days."

I can find nothing to justify the belief that Astruc (1746) should be given the credit of noting that comedones were follicular lesions. My inquiries lead me to believe that the relevant reference is a section of his grandiloquently named but surprisingly short *Treatise on All the Diseases Incident to Children*, entitled "Of the Crinones"; this concerns very young and well-nourished children who had a diffuse eruption of little moustache-like "hairs" growing out of the sebaceous follicles; he believed that these "hairs" were in fact the bodies of insects whose heads were buried in the follicular orifices. I cannot offer a suggestion as to the nature of the malady which he described, but it was not acne vulgaris.

Rayer (1835) discussed this matter in a footnote to the appendix of his book; he believed that the observations made by earlier workers were inexact and that crinones were either grubs (*tannes*) or else grease coating the surface of the skin made filamentous by rubbing. Willan and Bateman's work on acne is well known; they limited the concept of acne to four manifestations which they named acne simplex, acne punctata, acne indurata, and acne rosacea. Willan, in 1808, published the first part of a work which was to include acne in the later volume, but he died in Madeira before his task was completed. His colleague Thomas Bateman, in two volumes, *A Practical Synopsis of Cutaneous Diseases* and *Delineations of Cutaneous Diseases*, epitomised Willan's views. Bateman (1813) was probably the first to state that the "black points" which we now call comedones were "concreted mucus or sebaceous matter, moulded in the ducts of the sebaceous glands into a vermicular form, the extremity of which is blackened by contact with the air." It is very difficult, reading Bateman's works, to gather whether he appreciated that acne punctata was the first stage of acne, and I think the evidence indicates that he was somewhat confused about this matter. Certainly acne indurata is described as though it was disease *sui generis*. It was Samuel Plumbe of London who in 1824 protested against part of Willan and Bateman's classification of acne and was the first to recognise that there was an "ordinary progress of inflammation" whereby "little hard inflamed tubercles" form and that the process terminates in suppuration. Further, he noted that as a matter of precaution "such follicles as may exhibit a blackened surface" should be emptied by squeezing. Plumbe called the malady "acne," and included with what we now call acne vulgaris a description of rhinophyma and rosacea.

Plumbe recognised that the comedo was the primary lesion, that this was succeeded by what he called a tubercle (i.e., a nodule), and that this was in turn followed by a pustular lesion.

Erasmus Wilson (1842) divided acne into two sections —acne simplex, which was the acne vulgaris of Fuchs, and acne rosacea. His work marks the origin of the division between the two conditions which is accepted today.

Hebra recorded his views on the seat and symptoms of acne in 1845, and in his book (1868) had no essential alteration to make. His chapter entitled Acne Disseminata is a well-worked mine of historical as well as clinical information. His remark, in this chapter, that "the skin between the affected follicles will always exhibit . . . seborrhœa" has been accepted as a canonical statement for nearly 90 years. Although we require more information, Wheatley (1956), in a report to me on work in the skin and biochemical departments at St. Bartholomew's Hospital, states that his investigations indicate that there is a definite though small increase in sebaceous activity in acne vulgaris, but that on areas of skin where lesions arise the actual amount of sebum which can be obtained from the skin may be lower than normal, because of blocking of the sebaceous ducts.

Unna's work (1896) on the histopathology of the skin contains observations on acne, which are of fundamental importance; I shall refer to some of them later.

By 1900, Thibierge could define the acnes as maladies characterised by the retention of sebum and by inflammatory changes (due to bacteria) which follow and affect these glands. Those who are interested in the acne bacillus (usually accepted as identical with *Corynebacterium acnes*) and the hypothesis about the bacteriological ætiology of acne, must consult the works of the Master (1896) and those of Sabouraud (1897), Thibierge (1900), and their contemporaries; Pillsbury and Kligman (1954), in reviewing recent work on cutaneous bacteriology, state that the causal relationship of the acne bacillus to acne vulgaris is unproved, and that instead of being known as *C. acnes* the proper name for the organism is *Propionibacterium acnes*; it is anaerobic and has a numerical predominance over all other resident bacteria on the skin. However the bacteriological theory is not yet eliminated: J. P. O'Brien (1951), by analogy with the processes which he has observed in miliaria rubra, has tentatively suggested that low-grade bacterial infection within the lumen of the follicular ostia may serve to initiate the obstruction whereby the pores affected by acne are closed and stimulate the associated parakeratosis.

Before bacteria were invoked as a cause of acne, interest had been aroused in *Demodex folliculorum*. This parasite was first described in the ceruminous glands by Henle in 1841 and a year later by Gustave Simon (1842) in the sebaceous glands. It was at first described as an Acarus, but Mégnin assigned it to the family Demodicides. Despite Simon's claim that demodex might in some cases cause acne, this hypothesis was not widely accepted—cf. E. Wilson (1847).

Darier (1907) postulated that the state which he called *la kérose* constituted the necessary or usual background for certain acneiform eruptions. Later (1918) he defined *la kérose* as a chronic abnormality of the skin characterised by a mild diffuse hyperkeratosis, a tendency to fine desquamation, a modification of unknown nature of the skin fats, and hyperkeratosis of the orifices of the sebaceous follicles.

A paper by Pick (1921) is of importance because it marks the first impact of modern endocrinological views concerning the ætiology of the malady.

Of more recent papers, those in English which to my mind have been of great importance are those by Goldsmith (1925) on the bacteriology of acne and by Bloch (1931) reviewing a great number of adolescents; the synopsis of relevant endocrinological evidence by Cohen (1941); Hamilton's (1941) work on male hormone substance; and Grant's thesis (1951b) on the part played by hair in the production of the comedo. But it is perhaps invidious even to mention these, for there have been many other important contributions during the past 30 years.

Acne Vulgaris

Acne has recently been defined (MacKenna and Cohen 1955) as a dynamic skin reaction characterised by the presence of comedones and usually, but not necessarily, of papules and pustules. It is a syndrome in which neither exogenous agents nor medicaments are primary causes though they may be exacerbating factors.

The primary lesion is comedo and the secondary eruption is polymorphic; the latter was well described by Stokes and his collaborators (1942) and is composed of whiteheads (miliary sebaceous cysts), nodules, deep indurations without follicular pointing, pustules which are papules or nodules of variable size with soft centres, and cysts which may be steatoid (with or without secondary infection), or colloid; the latter type presumably arise after secondary infection, or perhaps from some local allergic reaction. Both types of cyst may canalise, cause much destruction, and leave scars. Fully formed lesions of acne may be deep, nodular, and congested, or superficial and inflammatory with rapidly forming superficial pustules. Both nodules and pustules leave a legacy of scars, and cheloidal scarring may develop.

Comedones have been noted in young children (Crocker 1884). There appear to be two varieties: the first an acne of endogenous origin which Hellier (1954) has suggested may be due to progesterone derived from the mother; the second (which is not, by definition, a true acne) due to follicular irritation caused, for example, by camphorated oil; Crocker himself blamed warmth and moisture as the cause. (It is worth noting that, possibly in a few cases, nævus unilateralis comedonicus has been confused with "grouped comedones.")

Bloch (1931) was the first to point out, after an examination of some 4000 girls and boys in Zürich, that acne, particularly in the form of comedones, can be found in so many young persons that it can be regarded as a physiological manifestation at the time of puberty. This view, which is generally accepted, was supported by Cohen (1954), who stated that acne vulgaris is a normal accompaniment of adolescence and that it is an abnormality only when it ceases to be very mild and is obviously noticeable. I propose calling this variety "physiological acne."

MacLeod (1920) described an intractable type of acne as "acne vulgaris of adult females" in which slowly developing, congested nodules develop on the chin and cheeks. He stated that comparatively few comedones were present in this condition, which is not uncommon between the ages of 25 and 40 or even later. This eruption has been investigated by Newman and Feldman (1954) and renamed "adult premenstrual acne": they deny the presence of comedones and attribute the condition to a deficiency of circulating progestins. A proportion of the women have previously suffered from acne vulgaris.

I have studied this eruption with some interest, and agree with many of Newman and Feldman's conclusions; but because of the absence of comedones, and because of the histological picture, I do not think we should now consider this eruption as a variety of acne vulgaris.

Certain endocrine abnormalities and diseases which cause masculinising changes also cause acneiform eruptions in adult women and in children. These eruptions are seen when masculinising tumours develop in the ovaries or adrenal glands, in precocious puberty of various causes, and in acromegaly. An acneiform eruption may be noted in Cushing's syndrome, although this was not mentioned in Cushing's original reports (Wiener 1955). Eruptions occurring in these circumstances should not be called acne vulgaris.

Follicular irritation from exogenous sources may be seen in infants (as has been noted earlier) and in adults, where it is usually due to occupational risks: the acneiform rashes arising in this way are not acne vulgaris; nor are the acneiform eruptions which may follow the administration of iodine or bromine.

Long-continued administration of cortisone to women may produce changes that suggest Cushing's syndrome, including acne and mild hirsutism (Spence 1953). Ingle (1950) has suggested that these latter symptoms may indicate that cortisone has weakly androgenic properties or that one of its metabolic products is androgenic. Spence (1953) states that administration of cortisone aggravates acne. Brunner, Riddell, and Best (1951) have reported profuse acne following a course of injections of corticotrophin (A.C.T.H.).

From these data we must, I think, suggest a reclassification, and I tentatively suggest the following:

CLASSIFICATION OF ACNES

1. Endogenous acne of infants (? acne vulgaris of infants).
2. Physiological acne vulgaris.
3. Acne vulgaris.
4. Acne conglobata.
   Perifolliculitis capitis abscedens et suffodiens.
5. Adult premenstrual acne.
6. Acneiform eruptions due to endocrine disease.
7. Acne venenata (eruption due to contact with exogenous irritants):
   (*a*) of infants;
   (*b*) of adults.
8. Acne medicamentosa (eruption due to drugs or hormones).
9. (Neurotic acne—*acné excoriée*.)
10. (? Grouped comedones of Thin.)

The critic will note firstly that I am suggesting the terms acne medicamentosa and acne venenata as alternatives to acne artificialis or symptomatic acne of older nomenclatures. Secondly that pseudo-acneiform eruptions due to tubercle bacilli are omitted, for obvious reasons. Acne cheloid is not included: MacLeod (1920) suggested it was a form of sycosis, and Lever (1954), who prefers the term folliculitis keloidalis, notes that early lesions have the same histopathology as the furuncle.

Acne necrotica seu varioloformis must, I think, be omitted, at any rate until more of its ætiology is known. The inclusion of endogenous acne of infants meets Hellier's (1954) suggestion that the malady is probably endocrine in origin. I have suggested the terms "acne venenata" and "acne medicamentosa" in conformity with the present accepted principle whereby contact dermatitis is known as dermatitis venenata, whilst eruptions due to drugs that have been administered internally are named dermatitis medicamentosa; but I appreciate that traditionalists may object to the relegation of the terms acne artificialis or symptomatic acne which have been employed for many years, and that, as *venenata* is derived from the verb *venenare* (to poison or envenom) there is scant justification for extending this form of nomenclature (but cf. *Hamlet*, Act I, scene vii).

Crocker (1884) described comedones in children and infants and said they appeared in groups. Thin (1888) was the first to use the term "grouped comedones"; his cases were in adults, and in his paper he refers fully to Crocker's work. Ormesby and Montgomery (1954) have pointed out that Thin's grouped comedones are smaller than the ordinary variety, are not associated with acne vulgaris, and show no tendency to inflammation and suppuration. I think that they are sometimes a form of acne venenata (certain non-European hair-oils seem sometimes to be responsible), but possibly they can be associated with a vitamin deficiency, or possibly a purely mechanical blockage. In view of the doubt about their ætiology I have included them in parenthesis at the end of the table. Neurotic acne is also shown in parenthesis, for reasons which every dermatologist will appreciate.

Pathology

It is widely believed that we know a great deal about the pathology of acne. Reading several modern books one gets the impression that an acne lesion is formed because a collar of horny cells forms inside the orifice of a pilosebaceous follicle, and the sebum, being unable to pass this obstruction, inspissates. The further history of the lesion, including pyococcal infection, follows the sequence of events described by MacLeod (1903), which I will recount later. Further, I have seen diagrams from quite reputable sources depicting comedones looking like bursting hand-grenades.

Unna (1896) very carefully stated that any comedo which is not in the act of being thrown off is formed underneath an uncoloured horny lamella, and described the following process:

> A superficial hyperkeratosis of the epidermis extends to the follicular orifices (this observation links up with Darier's *kérose*). At each of these ostia a cylindrical sheath of horny cells extends along the inner surface of the follicle, forming a mantle round the comedo. Meanwhile an accumulation of horny cells in vertical layers is pushed across the orifice, but these layers are forced upwards by pressure so that instead of being vertical, they become at first oblique and finally horizontal. Thus over the tip of a properly formed comedo there is an operculum of colourless horny cells.

This is shown clearly in Unna's illustration: it is shown by MacLeod (1920), and there is a diagram in Desaux's book (1948) confirming this view. Recently O'Brien (1951) has also emphasised the importance of keratinous obstruction in acne, although in his view this obstruction is initiated from a ring-like encirclement of keratin always present at the follicular orifice. The comedo which forms is a mass of secreted material and cellular debris, usually with a number of lanugo hairs bent, twisted, or rolled into bundles (Unna 1896).

We do not know how the comedo forms. Cohen (1956) has recently dealt with numerous hypotheses, the most acceptable of which appears to me to be that of Grant (1950, 1951b), whose opinion is that the hair in each pilosebaceous follicle has a function, in assisting the evacuation of sebum and cellular debris, exactly analogous to the function of a rubber drain in an abscess cavity. Probably the hair is aided by the slight movement of its growth and by the action of the musculus arrector pili. Grant (1950) confirmed an observation by Milton (1872) that hairs are not seen issuing from follicles blocked by comedones; but one or more hairs lie buried in each comedo. The failure of hairs to penetrate the follicular ostia may occur either from failure of growth, or from curling of the hair within the follicles. Because he has seen it happen, Grant believes that if, after a comedo has formed, a hair produced in the appropriate part of the follicle acquires enough strength it will penetrate the follicular mouth and re-establish drainage. Finally, to meet criticism which we shall study later, Grant suggests that if a follicle is stimulated to produce more sebum it will produce less hair, and vice versa. If the hair growth is affected to such an extent that a new hair has not grown sufficiently to take over follicular drainage before its predecessor in that follicle is shed, the stage is set for the formation of a comedo.

Observations by Cohen (1945a) and Bourne and Jacobs (1956) assist Grant's hypothesis. Cohen, after examining 5000 women, found no support for the view—which some had held—that there was a relationship between acne and hypertrichosis; Bourne and Jacobs (1956) after examining 2720 soldiers, 15–40 years of age, discovered that facial acne is by far the commonest form of the malady until the age of 18, when the beard hair is well established; then the facial acne diminishes and may disappear and the predominant site of the eruption tends to change to the trunk.

When, after a variable time, the acne lesion passes from the comedo stage to become a nodule, the inflammatory process is an unusual one. It was described at great length by Unna (1896), who noted proliferation of spindle cells, multipolar cells, plasma cells, and mast cells, and later the appearance of giant cells. Leucocytes, he said, are almost absent in the nodular stage unless "artificial suppuration" occurs, and he was emphatic that the suppuration which normally develops in acne could not be attributed to pyococci. Despite Unna's opinion on suppuration MacLeod (1903), usually one of the most meticulously accurate of observers, was, I suggest, led into error over this important detail. He wrote:

"by plugging of the funnel of the follicle the sebaceous material is prevented from escaping and the gland undergoes a cystic distension. In the retention cyst pus-cocci readily proliferate. The action of the cocci results in the formation of a small abscess, which is generally peri-follicular, but which may begin in the wall of the follicle. . . . In the corium a dense mass of granulomatous cells forms in which are plasma cells, multinuclear cells (chorioplaques) and connective tissue spindles. This cellular infiltrate accounts for the nodular appearance of old cases of acne and for the difficulty in obtaining pus when the nodules are incised. Organisation frequently occurs in these granulomatous cells and scarring may be produced."

Goldsmith (1925) gave cogent reasons why the pustulation could not be caused by staphylococci, and stated (1936) that Sabouraud agreed with this view. Here one may interpolate a recent observation by Cronk and his associates (1956) that tetracycline hydrochloride given orally can cause improvement in many cases of acne, even though the bacteria cultured from the lesions are insensitive to the drug; it is thought that the antibiotic has a pharmacological effect in these cases and that the benefit may not be due to antibacterial action.

The skin of acne nodules is red: Weidman (1940) suggested that the erythema might be due to choline in the sebum, but a report by Ottenstein et al. (1952) showed that there is less choline in the sebum of comedones than in sebum taken from normal patients.

Some hold that the papular, nodular, and pustular phases in acne are due to foreign-body reaction. Lever (1954), who believes that secondary infection also plays a part, describes atrophy and fragmentation of the affected glands, probably due to stasis and pressure caused by the comedones; he thinks that the fragmentation of the glands causes the inflammatory reaction, but in contrast to Sutton (1956) he finds no evidence of tuberculoid reaction. Lynch (1940) in an interesting paper writes:

"perhaps the persistence of a comedo leads to atrophy and fragmentation of some of the glandular appendages. These fragments then become surrounded with an infiltrate of lymphocytes, plasma cells and even giant cells."

Grant (1956) suggests that the otherwise ineffectual hairs in the comedo should be remembered, for they may provoke a foreign-body reaction. Sutton (1956) who regards acne as a form of pustular lipoidosis, sees in these changes a tuberculoid inflammatory reaction to sebum, which is present in excess because of the patient's improper metabolism of lipoids. In his view it is the sebum which provokes the acneiform eruption when the epidermal barrier is defective and the inflammatory changes may ensure the removal of the oily material either by phagocytosis, by discharge of oil through rupture of a pustule, or by enduring imbibition of oil by fixed-tissue elements so that a xanthoform cheloid-like scar persists; or epithelium may grow round the oil, separating it from the tissues capable of inflammatory response, so that a cyst is formed.

Those who study these matters will appreciate that the pathology of acne offers ground for a difficult but fruitful investigation. May I add here that I have not complicated my remarks by any reference to what Unna called "artificial suppuration"—i.e., to secondary pyococcal infections of acne lesions. They do occur, but they are fortuitous incidents and not relevant to our present inquiry: Stokes et al. (1942) may be consulted on this matter.

Facts and Fallacies

I have now reached a stage when, rather than review a mass of data from most countries where dermatologists are active—a task which in this country has been ably performed by Cohen (1954) and by Goldsmith and Hellier (1954)—I shall deal with some facts which are perhaps overlooked, and some fallacies which have crept into being.

A classical scholar may well object to the phrase "a comedo"; its use is justified only by custom and the queer jolt which the absence of the preposition gives to a sentence. The words "comedone" and "comedos" should be dropped; comedo for the singular noun, having comedones as its plural, should suffice.

It should be remembered that comedones are not necessarily simple lesions: Ohmann-Dumesnil (1886) first described double comedones, most frequently seen on the back; these are closely contiguous blackheads which have common glandular communicating chambers. Many, following Bateman (1813), believe that the blackness of the head of the comedo is due to oxidation changes. If Unna (1896) was correct in stating that the part in communication with the atmosphere did not turn black, is Bateman's view correct? Wheatley (1956) tells me that if sebum is left in an unsealed capillary tube at 37°C for six weeks, it does not turn black at the surfaces exposed to the air; he thinks that the black colour may be due to the presence of melanin-like pigment.

Hitherto some have regarded dandruff (pityriasis capitis) as having an association with acne. Cohen (1945b) found no significant correlation between acne and dandruff apart from an increase of "total acne" on the chin (as distinct from the face) in women with gross dandruff. Bourne and Jacobs (1956) found that the incidence and severity of acne were the same in men with all grades of pityriasis capitis; in fact, in their series, 57·8% of men with severe acne did not have dandruff. They found that dandruff was more common in red-headed persons ("ginger subjects") but that there was no correlation between acne and the colour of skin and hair. Seborrhœic dermatitis may be seen in patients who have acne, but this is uncommon. Cohen (1945b) has given the result of a statistical inquiry into this matter.

In regard to age, Bourne and Jacobs of Wolverhampton (1956), who noted that there is probably a geographical variation in the prevalence, examined 2720 soldiers and found most acne at the age of 18–19. There is agreement about this: Forbes (1946), dealing also with British soldiers, found that the highest prevalence was at 18–19 years. Cohen (1945c) found in young women that at the age of 19 the prevalence was highest. After that age the prevalence steadily diminishes, but it is not true that acne always disappears by the age of 30. Thus between the ages of 30 and 40 Bourne and Jacobs (1956) found that 15% had clinical acne whilst Cohen (1942) found that 16% suffered from the malady; Forbes (1946) stated that in a series of 2500 men, over 10% between 30 and 49 years (inclusive) had clinical acne. Finally, in this section we may note that Cohen (1954) says that very severe acne is more common in boys than in girls.

Basic Ætiological Factors

As for the basic ætiological factors we in England—largely owing to the late Dr. H. W. Barber, of Guy's Hospital (1948)—have been most impressed by the endocrine theory. For centuries it has been recognised that acne is associated with the physiological changes of puberty, and this view was finally clinched by the classical observations of Bloch (1931). It was natural, therefore, that, as our knowledge of endocrinology increased, attempts would be made to elucidate the part played by the ductless glands. As early as 1913 Malcolm Morris, in a paper on the internal secretions in relation to dermatology, included a reference to acne, but merely stated that "it responded well to thyroid extract."

Pick (1921) is usually given the credit for the first step in the modern direction: he incriminated the pituitary sex-apparatus. By 1941 Cohen was able to publish a paper on acne containing 358 references to endocrinological work; he found that conflict in the reports made adequate conclusions impossible, but, inter alia, it was definite that whenever some endocrine disorder was clearly present, its treatment would also improve the acne.

Hamilton's (1941) paper entitled Male Hormone Substance a Prime Factor in Acne attracted much attention. He said that hereditary predisposition is indisputable.

In support of this he quoted Siemens (1924, 1926) and Pusey and Rattner (1934). Other appropriate references are Stokes and King (1932) and Hellier (1939). As Stryker and Bloom (1938) point out, it is the physiological background necessary for the development of acne which is inherited.

He dismissed local infection of sebaceous glands, foci of infection elsewhere, constipation, cold, and other ætiological factors, some belief in which was hallowed by tradition. He confirmed the earlier observation (Hebra 1868, Rigler 1868) that eunuchs do not acquire acne, but emphasised that testosterone produces sebaceous activity and comedo formation, and, in these subjects, may produce acne papules and pustules. He showed that acne accompanies elevation of androgen levels in body tissues and fluids, and noted that, although androgens stimulate sebaceous secretion on parts of the body not subject to acne, they do not produce acne lesions on these sites. He suggested that androgens stimulate seborrhœa either by direct action on the sebaceous glands or indirectly through increased vascularity, hydration of the tissues, influences on the fat metabolism, or otherwise. He thought that androgenic activity might also account for epithelial hyperplasia at the necks of the follicles. Hamilton noted that, although he could produce 500 or more papules and pustules with testosterone (the hormone being given in various ways but particularly in doses of 5–10 mg. intramuscularly 3 times a week for twelve weeks) neither induration nor conglomeration of the affected follicles occurred. In eunuchs testosterone produced red areas in the skin surrounding rapidly growing hairs on the legs, but comedones and pustules did not form on these parts; in view of Grant's theory this observation has much interest.

Hamilton's evidence disproved an earlier suggestion of Bloch's (1931) that only the comedo, and never the papule and pustule, could be related to the endocrine system. In Hamilton's view both papules and pustules depend on endocrine stimulation of the pilosebaceous apparatus.

Finally it should be noted that Hamilton observed that in hypogonadal patients the skin assumes a coarse roughened appearance when androgens are administered. This observation presumably may be correlated with Unna's observation, and with Darier's. After cessation of treatment some patients show peeling of the outer layers of the epidermis, and this desquamation may extend to most of the body save the corneæ and possibly the palms and soles. Hamilton worked largely with testosterone: Dunlop (1951) in a more recent paper includes somatotrophin as a stimulator of surface epithelium and the sebaceous glands, producing seborrhœa and acne.

There is a good deal of evidence (see Cohen 1941, Hamilton 1941) that in acne the levels of œstrogenic substances in the blood and urine are low—a change which may be secondary to the rise in androgens. Wile, Barney, and Bradbury (1939) estimated the urinary œstrogen output in 12 female acne patients and 20 controls. The average œstrogen output in the acne patients was 4·1 rat units per litre, compared with 7·7 in the controls. Wile, Snow, and Bradbury (1939) found that comparing the daily excretion of androgen and œstrogen, the ratio was 8·9 for normal men but 17·8 for men with acne. In women with acne the androgen/œstrogen ratio was 4·7, compared with 2·7 in normal females. MacGregor (1951) carried matters a little further when he wrote: "the occurrence of acne during adolescence is associated with an upset in the normal androgen/œstrogen ratio; although the excretion of androgen may be within normal limits it is relatively increased in proportion to œstrogen." He referred to Lawrence and Werthessen (1939) who had warned their readers that because of differences in technique their figures could not be compared with those of Wile, Snow, and Bradbury (1939) but had confirmed that the urinary œstrone equivalent is lower in the patients with acne than in normal subjects, and that there is a higher urinary androgen/œstrone ratio in the patients. They showed that there is a significant decrease in the urinary excretion in women with acne, but no significant change in excretion of urinary androgens. In their view, from the clinical aspect the alteration of the androgen/œstrogen ratio was more important than the decrease in excretion of œstrogens. Rothman (1954) thinks that theoretically this hypothesis may be valid, but points out that because eunuchoid and castrated men, who never have acne, may show considerable variations in the androgen/œstrogen ratios, the significance of this hormone ratio in the pathogenesis of acne is debatable. Finally, we must note that Dubovyl (1955) has shown that there is a decided increase of 17-ketosteroid excretion through the sebum in acne; the ketosteroids concerned are of an androgen type. This is an important observation which is being pursued.

The source of androgen is the adrenal glands in females and the testis in males; the source of œstrogen is the ovaries in females and the testes and adrenal glands in males. Œstrogens inhibit sebaceous activity, and their effect on the skin is directly opposite to that of androgens (Dunlop 1951, Jarrett 1955).

Four questions on which authors hesitate are:

1. If acne is due to imbalance of hormonal secretions, why does it develop only on certain well-defined sites?

2. What is the relationship of hormonal secretion to development of lanugo hair? This is important in regard to Grant's hypothesis.

3. What part, if any, do progestins play in the development of acne in women?

4. Does acne depend on the internal secretions of the thyroid gland?

1. It is widely believed that at the sites of election of acne the follicles are particularly susceptible to androgen/œstrogen imbalance. This requires critical assessment—cf. Cohen's references (1941) to work by Zuckerman (1940) and Desaux (1938). Further, Wheatley (1956) states that the areas attacked by acne are those which have higher sebum levels than the other parts of the body.

2. I have not been able to discover much information about the effect of endocrine secretion on lanugo hairs, but Grant (1950, 1951b) makes the interesting point (already mentioned) that when a follicle is stimulated to make more sebum, less hair will be grown, and vice versa. We know that the growth of scalp hair is inhibited by androgens and stimulated by œstrogens (Dunlop 1951) and that sexual hair on the face, chest, and abdomen is definitely influenced by the gonads, androgens probably being responsible (MacGregor 1951); further it is known that in eunuchs treatment with testosterone increases the growth of facial and body hair (Dunlop 1951).

3. Aron-Brunetière (1952) suggested that in women the androgen-plus-progesterone/œstrogen ratio was more significant than the androgen/œstrogen ratio, and claimed that this enables one to account for the presence of acne in Cushing's syndrome, for the acneigenic action of corticotrophin (A.C.T.H.) and for the fact that œstrogens are more active in men than women. This point has been emphasised by Cohen (1954), who refers to Vignes (1937) and Tzanck et al. (1951).

Certain authorities (Rothman 1954) believe that progesterone has an androgen-like effect on the sebaceous glands, and yet references to benefit from treatment with progesterone keep occurring in the literature.

Deductions from the results of treatment are always a cause of controversy between scientists and clinicians, but for record purposes one must note that Way and Andrews (1950) gave an average of 17 injections of progesterone at intervals of seven to fourteen days to women in a dosage varying from 4 to 6·6 mg., with 50% of good results. Belisario (1951) reported that of 10 females with acne who received a weekly injection of 5 mg. progesterone for an average of fifteen weeks, "good results" were obtained in 7; he holds that œstrogens and progesterone are of particular value in those women whose acne is worse before or during the menses, "because the excretion of œstrogens and pregnanediol (the excretion product of progesterone) is low just before and during menstruation." Belisario also treated twelve males with 'Proluton C' in doses of 30 mg. a week; in 10 of these cases he obtained "good results."

It is just possible that anachronisms such as the use of the testosterone for the treatment of acne in males can be explained by a theory of retaliation. Just as, when alkalis are taken, the hyperchlorhydric stomach may be provoked to secrete more acid, so possibly—and fortunately for the clinicians—the use of testosterone for acne may act as a stimulant so that the testes and adrenals produce an excess of œstrogens: in considering this suggestion we may also remember Dunlop's statement (1951) that the liver in males can more readily inactivate androgens than œstrogens.

4. Sulzberger and Baer (1949) have stated that abnormally low thyroid activity usually leads to disturbed keratinisation, often associated with increased formation of horny cells at the follicular orifices. Belisario (1951) found that the basal metabolic rate was low in 5% of 300 consecutive cases of acne in Sydney, Australia, and when thyroid extract was given to these persons in appropriate doses it "almost invariably" conferred "marked benefit." Cohen drew attention to the great variation in opinion about the value of thyroid extract in treatment, Continental authorities tending to associate acne with hyperthyroidism, whilst American workers laid more stress on the influence of hypogonadism. Le Winn and Zugerman (1942) in a study of fat tolerance as indicated by blood-cholesterol changes following the ingestion of fat, failed to find any significant difference in the blood-cholesterol levels of a group of 20 persons with acne compared with a group of controls. Rothman (1954) says that little is known about the influence of the thyroid gland on sebaceous activity, but it seems that thyroidectomy in the young causes a regression of the pilosebaceous apparatus as a whole.

No-one who is investigating the possible correlation between thyroid activity and acne can afford to neglect a critical evaluation of the views which Sutton (1956) has held for many years. Sutton points out that constipation, dyspepsia, liability to fatigue, lack of being refreshed by sleep, anæmia, and menstrual derangements are frequently concomitants of acne, and that these are also symptoms of hypothyroidism. He strongly advocates the administration of thyroid extract in treatment. Sutton has tenaciously clung to these views despite a good deal of scepticism and criticism.

Perhaps I should here interpolate some recent findings on body-weight in relation to acne. Up to the age of 20, acne is not related to obesity in men; but after that age men with acne tend to be heavier than those without acne (Bourne and Jacobs 1956). The members of the older group have a modal weight 10 lb. (4·5 kg.) above the standard normal. The cause of this is uncertain. Leonard Simpson (1956) has pointed out that an excess of androgens without excess of other hormones is not usually associated with obesity, but an excess of adrenal glucocorticoids is often associated with it. Stewart, Webb, and Hewitt (1955), after studying the records of 1718 males, concluded that the risk of developing acne increased about 8% with every increase of 10 lb. (4·5 kg.) in weight and that the prevalence of acne varies in response to weight by a factor of about 2·5 in men under the age of 20.

At present the activities of the pituitary gland are seldom mentioned in regard to acne, probably because attempts at treatment with pituitary extracts have not been successful. The gonadotrophins are the most important of the anterior-pituitary hormones. They are three:

(1) A follicle-stimulating hormone, which stimulates the growth of follicles in the female and is responsible for the development of seminiferous tubules in the male.

(2) A luteinising hormone, which in the female causes ovulation, luteinisation of the follicles, development of corpora lutea, and release of œstrogens, and in the male stimulates the interstitial cells of the testes and the production of androgens.

(3) Luteotrophin, which appears to stimulate the corpora lutea to secrete progesterone. Luteotrophin may be identical with the lactogenic hormone named prolactin (Martindale 1952).

MacGregor (1951) has stated that during the second half of the menstrual cycle a considerable dose of œstrogen can be given orally without any effect on menstruation, but during the first half of the cycle it may inhibit anterior-pituitary activity, cause failure of ovulation, and upset menstrual periodicity; in the male, through inhibition of the anterior pituitary, testicular function may be upset. Hence it is not beyond the bounds of possibility that acne may be associated with pituitary defects; but many believe at present that if acne was primarily due to pituitary dysfunction there would be concomitant signs which would decisively incriminate that gland. We shall have to know more of the validity of the hypothesis of "selective" or "incomplete" pituitary failure before we can proceed further.

Conclusion

It would, I fear, prolong this lecture unduly if I referred to other matters in regard to acne; the influence of diet, for example, is a vexed question, but it is interesting to note that Belisario (1951), after visiting Great Britain and the U.S.A., found that the only generally unanimous opinion among dermatologists about this was that chocolate is harmful. Those interested should consult Urbach and Le Winn (1946) and Sutton (1956), as well as the many references in Belisario's paper.

Focal sepsis is seldom mentioned nowadays; Loveman, Noojin, and Winkler (1955) found that there was no significant difference in the intestinal flora of 10 patients with severe pustular acne vulgaris and the flora obtained from 10 normal persons. Neither shall I deal with some other matters of major importance such as water-balance, sweating, anæmia, and emotional disturbance, nor less important but cogent topics such as the contact inoculation factor of Stokes and Sternberg (1939), the rôle of vitamin A, the effect of cosmetics, and the possible ill effects of wearing wool or going to the tropics. I shall have achieved my purpose if my investigations of the early literature correct some current misapprehensions, and if the epitome of more recent and modern literature, and the points to which I have drawn attention, have been of interest.

Whilst at present I hold the opinion that the hormonal explanation of acne is of fundamental importance, as a clinician I believe that in most cases the eruption is due to a malevolent synthesis between fundamental and subsidiary factors. Success in treatment, particularly in difficult cases, is proportionate to the attention given to all the factors concerned; one has only to remember, for instance, that there is evidence of a definite relationship between emotional states and sebaceous activity—which has a marked effect on acne subjects (cf. Lorenz, Graham, and Wolf 1951, 1953)—to appreciate the need for very critical assessment of each case.

Finally, I think one should emphasise that further study along the lines of Scott's investigations (1957) into the absorption of sulphur into the skin in seborrhœic cases would probably indicate that this element—whose use is hallowed by tradition—does more than destroy or weaken the horny lamellæ which close the affected glands.

To the clinician, acne is still a difficult problem and one which should stimulate our best endeavours.

My thanks are due to the President and Council of the Royal College of Physicians, and to many who have given me assistance: particularly to Dr. E. L. Cohen, Dr. R. N. R. Grant, Dr. I. Macalpine, Dr. A. Scott, Dr. A. W. Spence, and Dr. V. R. Wheatley for technical information and helpful criticism, and to Mr. J. L. Thornton, librarian at St. Bartholomew's Hospital, Mr. L. M. Payne, assistant librarian at the Royal College of Physicians, and the staff of the library at the Royal Society of Medicine.

REFERENCES

Ætius, A. Tetrabiblion 2, Basle, 1535; sermo 4, cap. 13. De Re Medica, Basle, 1542; sermo 8, cap. 13.
Aron-Brunetière, R. (1952) *Excerpta med. Amst.* sect. xiii, **6**, 343.
Astruc, J. (1746) Treatise on All the Diseases Incident to Children. London.
Barber, H. W. (1948) Modern Trends in Dermatology (edited by R. M. B. MacKenna). London; chap. 6.
Bateman, T. (1813) Practical Synopsis of Cutaneous Diseases. London.
— (1817) Delineations of Cutaneous Diseases. London.
Belisario, J. C. (1951) *Aust. J. Derm.* **1**, 85.
Bloch, B. (1931) *Brit. J. Derm.* **43**, 61.
Bourne, S., Jacobs, A. (1956) *Brit. med. J.* i, 1268.
Brunner, M. J., Riddell, J. M., Best, W. R. (1951) *J. invest. Derm.* **16**, 205.
Cazenave, A. (1838) Abrégé pratique des maladies de la peau. Paris.
Chadwick, J., Mann, W. N. (1950) The Medical Works of Hippocrates. Oxford.
Chambers, E. (1738) Cyclopædia, or an Universal Dictionary of Arts and Sciences (&c.). London. vol. i.
Cohen, E. L. (1941) *Brit. J. Derm.* **53**, 231, 269.
— (1942) *Lancet*, i, 168.
— (1945a) *Brit. J. Derm.* **57**, 102.
— (1945b) *Ibid*, p. 45.
— (1945c) *Ibid*, p. 10.
— (1954) British Encyclopædia of Medical Practice (Interim Supplement). London.
— (1956) *Brit. J. Derm.* **68**, 362.
Crocker, H. R. (1884) *Lancet*, i, 704.
— (1888) Diseases of the Skin. London.
Cronk, G. A., Naumann, D. E., Heitzman, E. J., Marty, F. N., McDermott, K. J., Vercillo, A. A. (1956) *Arch. Derm. Syph., Chicago*, **73**, 228.
Darier, J. (1907) *Ann. Derm. Syph., Paris*, **8**, 3.
— (1918) Précis de dermatologie. Paris.
Desaux, A. (1938) *Bull. Soc. Méd., Paris*, p. 603.
— (1948) Traitement des dermatoses communes. Paris.
Dubovyĭ, I. (1955) *Vestn. Vener. Derm.* no. 2, p. 22.
Duhring, L. A. (1876) Diseases of the Skin. Philadelphia.
Dunlop, D. M. (1951) *Brit. J. Derm.* **63**, 43.
Eyselius (1711) Dissertatio de Comedonibus. Erfurt.
Forbes, H. A. W. (1946) *Brit. J. Derm.* **58**, 298.
Fuchs, C. H. (1840) Die Krankhaften Veränderungen der Haut und ihrer Anhänge. Göttingen; vol. i.
Goldsmith, W. N. (1925) *Ann. f. Derm. Syph.* **149**, 575.
— (1936) Recent Advances in Dermatology. London.
— Hellier, F. F. (1954) Recent Advances in Dermatology. London.
Gorræus, J. (1564) Definitionum Medicarum. Paris; p. 12b.
Grant, R. N. R. (1950) A Predisposing Factor in Acne Vulgaris. M.D. thesis, Cambridge.
— (1951a) *Proc. R. Soc. Med.* **44**, 647.
— (1951b) *Clin. J.* **80**, 260.
— (1956) Personal communication.
Hamilton, J. B. (1941) *J. clin. Endocrin.* **1**, 570.
Hebra, F. (1845) *Z. der K.K. Ges. Aerzte Wien*, **1**, 144.
— (1868) Diseases of the Skin. London; vol. ii.
Hellier, F. F. (1939) *Brit. J. Derm.* **51**, 109.
— (1954) *Ibid*, **66**, 25.
Henle, F. G. J. (1841) See Crocker (1888).
Hippocrates. See Chadwick and Mann. (1950).
Hoefle, M. R. (1846) *Arch. ges. Med.* **8**, 315.
Ingle, D. J. (1950) *J. clin. Endocrin.* **10**, 1312.
Jarrett, A. (1955) *Brit. J. Derm.* **67**, 165.
Jonston, J. (1648) Idea Universæ Medicinæ. Amsterdam; lib. 6, cap. 5, art. 2, p. 283.
Lawrence, C. H., Werthessen, N. T. (1939) *Endocrinology*, **27**, 755.
Lentinn, J. C. (1711) De comedonibus (von Mitt-Essern), Erfurt.
Lever, W. F. (1954) Histopathology of the Skin. London.
Le Winn, E. B., Zugerman, I. (1942) *J. publ. clin. Med.* **28**, 190.
Lorenz, T. H., Graham, D. T., Wolf, S. (1951) *Trans. Ass. Amer. Phys.* **65**, 435.
— — — (1953) *J. Lab. clin. Med.* **41**, 11.
Loveman, D. E., Noojin, R. O., Winkler, C. H. jun. (1955) *J. invest. Derm.* **25**, 135.
Lynch, F. W. (1940) *Arch. Derm. Syph., Chicago*, **42**, 593.
MacGregor, T. N. (1951) *Brit. J. Derm.* **63**, 52.
MacKenna, R. M. B., Cohen, E. L. (1955) *Excerpta. med. Amst.* sect. xiii, **9**, 293.
MacLeod, J. M. H. (1903) Practical Handbook of the Pathology of the Skin. London.
— (1920) Diseases of the Skin. London.
Malpighi, M. (1689) De Structura Glandularum Conglobatum (Epistola Regiæ Societati, 1688). London.
— (1697) *Opera Omnia*. Leyden. (See the essay *De Externo Tactus Organo* and (in the posthumous works) a letter to Borelli dated Aug. 17, 1663.)
Martindale, William (1952) Extra Pharmacopœia, London; vol. i.
Mégnin (1900) La pratique dermatologique. Paris; vol. i, p. 346. See also Crocker, H. R. (1888), who spells the name Meguin.
Milton, J. L. (1872) *Edinb. med. J.* **50**, 27.
Morris, M. (1913) *Brit. med. J.* i, 1037.
Newman, B. A., Feldman, F. F. (1954) *Arch. Derm. Syph., Chicago*, **69**, 356.
O'Brien, J. P. (1951) *Aust. J. Derm.* **1**, 118.
Ohmann-Dumesnil, A. H. (1886) *J. cutan. Dis*, **4**, 33, 193.
Ormesby, O. S., Montgomery, H. (1954) Diseases of the Skin. London.
Ottenstein, B., Boncoddo, N., Walker, A., Thurmon, F. M. (1952) *J. invest. Derm.* **19**, 105.
Pick, W. (1921) *Arch. Derm. Syph., Wien*, **131**, 350.
Pillsbury, D. M., Kligman, A. M. (1954) Modern Trends in Dermatology. (Edited by R. M. B. MacKenna.) London; chap. 11.
Plenck, J. J. (1783) Doctrina de Morbis Cutaneis. Vienna.
Plumbe, S. (1824) Practical Treatise on Diseases of the Skin. London.
— (1837) *Ibid*. 4th ed., London.
Pusey, W. A., Rattner, H. (1934) *Arch. Derm. Syph., Chicago*, **29**, 706.
Rayer, P. (1835) Traité des maladies de la peau. Paris; vol. i.
Rigler (1868) Personal communication quoted by Hebra (1868).
Riolanus, J. (1638) De Arte Bene Medendi. Paris; sect 1, Tr. 2; cap. 5, p. 464.
Rothman, S. (1954) Physiology and Biochemistry of the Skin. Chicago.
Sabouraud, R. (1897) *Ann. Inst. Pasteur*, **11**, 134.
Scott, A. (1957) *Brit. J. Derm.* (in the press).
Siemens, H. W. (1924) *Arch. Derm. Syph.* (*Berlin*), **147**, 1.
— (1926) *Münch. med. Wschr.* **73**, 1514.
Simon, G. (1842) *Müllers Archiv*, p. 218.
Simpson, S. L. (1956) *Brit. med. J.* i, 1425.
Spence, A. W. (1953) Clinical Endocrinology. London.
Stenson, N. (1667) Elementorum Myologiæ Specimen. Florence.
Stewart, A., Webb, J. W., Hewitt, D. (1955) *Brit. J. prev. soc. Med.* **9**, 97.
Stokes, J. H., King, A. D. (1932) *Arch. Derm. Syph., Chicago*, **26**, 456.
— Sternberg, T. A. (1939) *Ibid*, **40**, 345.
— et al. (1942) A Handbook of Fundamental Medical Dermatology. Philadelphia.
Stryker, G. V., Bloom, M. G. (1938) *Sth. med. J. Bgham, Ala.* **31**, 741.
Sulzberger, M. B., Baer, R. L. (1949) Year Book of Dermatology and Syphilology. Chicago.
Sutton, R. L. (1941) *Sth. med. J. Bgham, Ala.* **34**, 1071.
— (1956) Diseases of the Skin. London.
Thibierge, G. (1900) La pratique dermatologique. Paris; vol. i.
Thin, G. (1888) *Lancet*, ii, 712.

References continued at foot of next column

RECURRENT GOITRE

JOHN E. PIERCY
F.R.C.S., F.R.C.S.E.
SURGICAL SPECIALIST IN CHARGE OF THYROID UNIT

M. J. LANGE
F.R.C.S.E.
CONSULTANT ASSISTANT SURGEON

NEW END HOSPITAL, LONDON

IN a recent period of just over four and a half years, of 3500 new patients seen at the thyroid clinic and department of endocrinology of the New End Hospital 306 (8·7%) had had previous operations for either goitre or thyrotoxicosis. Further examination, however, revealed that only 118 of this alarmingly large number of 306 were true recurrences, either of goitre or of thyrotoxicosis.

A large majority of the remaining 188 included the climacteric female, the patient with anxiety state, and the patient with vague cervical symptoms, most of them associating their emotional stresses with their previous operation.

Several others were found to be hypothyroid, with the remnants of the thyroid gland hypertrophied from incessant stimulation by the thyrotropic hormone of the pituitary gland because of the inadequate level of thyroxine. In such cases the administration of thyroid extract invariably produced clinical improvement and diminished the size of the remnants, which had obviously undergone physiological hypertrophy.

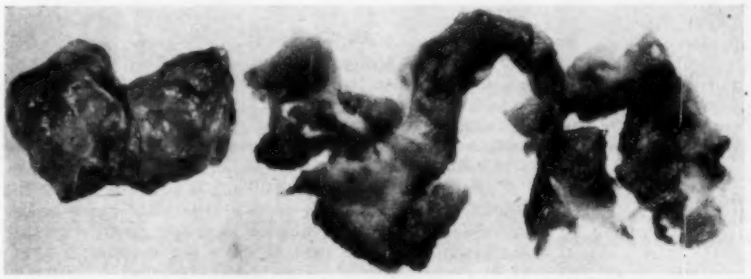


Fig. 1—Thyroid-shaped cyst packed with gauze (⅓ of actual size).

Other patients were referred to the unit with recurrent laryngeal nerve paralysis or with severe or progressive exophthalmos.

2 further patients were referred with permanent tetany:

(1) A woman, aged 21, who had undergone two previous operations; she improved on dihydrotachysterol ('A.T.10') and large oral doses of calcium lactate.

(2) A woman, aged 32, who had undergone one previous operation; her tetany, which was dramatically aggravated during menstruation, did not respond to the usual remedies but greatly improved when her intake of phosphorus was radically curtailed.

6 patients were seen who had ugly, keloid, or adherent scars; they subsequently had plastic operations.

Also included in this category of "false" recurrences were 11 patients who had undergone biopsy or thyroidectomy elsewhere and were found to have carcinomatous changes. In these our usual procedure is to undertake total thyroidectomy or near-total thyroidectomy followed by radio-iodine ablation, if indicated.

A woman, aged 42, who had undergone thyroidectomy eighteen months previously, had four months' history of a recurrent lump in the neck associated with pressure symptoms. Preoperatively it was noted that the thyroid swelling was compressible. At exploration a fibrous-walled cyst shaped like a thyroid gland was found packed tightly with what appeared to be absorbent gauze (fig. 1).

Of the 118 (3·4%) true recurrences 17 were treated with radioactive iodine and the 101 others underwent further surgery.

Choice of Treatment

The advent of radioactive iodine is welcomed as a valuable addition to our armamentarium. Even surgeons with a wide experience of toxic recurrences would, in certain selected cases, appreciate a remedy other than surgery.

In the first instance the patient's own wishes are considered. If she expressly refuses a second operation, we advise treatment with radioactive iodine, even though the evidence of toxicity is minimal, as an insurance against future trouble, particularly cardiovascular complications; but, if pressure symptoms, especially stridor, are present, it would be incumbent on the surgeon to explain to the patient the advisability of having an operation rather than radioactive iodine.

Contra-indications to Surgery

A history of altered or lost voice after the initial operation must be considered. We now examine the vocal cords of all the patients both before and after operation. If both cords are found to be functioning normally, there is no objection to surgery. If the recurrence is unilateral, and the homolateral cord is immobile, again there is no objection to surgery. If, however, the contralateral cord is paralysed, the surgeon would be advised to reassess the case and, from examination of the neck, to estimate the hazards that might be expected. If the recurrence appears to be unduly adherent or fixed, or if there is any doubt, radioactive iodine is recommended. If the recurrence is bilateral, the same rules apply—namely, the surgeon's experience, and whether the operation is going to be technically easy or difficult.

A history of tetany after the first operation, particularly with diffuse toxic enlargement of the gland, must seriously be considered as a contra-indication to surgery. In this connection it must be remembered that the diffusely enlarged toxic thyroid gland yields better to radioactive iodine than does the nodular type. Furthermore, in the technique adopted at this unit the parathyroid glands are less liable to trauma in the nodular goitre.

Cardiovascular involvement in the so-called "cardiotoxic" cases is a contra-indication to surgery except in the following circumstances:

(1) The patient has been in hospital for a rest, observation, and rehabilitation with a view to accruing the maximal cardiac reserve.

(2) All signs of congestive failure have been eliminated.

(3) The surgeon is satisfied that the operation will be neither prolonged nor technically difficult.

If criteria (1) and (2) are satisfied but criterion (3) is not, radioactive iodine is indicated.

DR. MACKENNA: REFERENCES—*continued*

Tsanck, A., Aron-Brunetière, R., Kohen, I. (1951) *Bull. Soc. franç. Derm. Syph.* **58**, 493.
Unna, P. G. (1896) Histopathology of the Diseases of the Skin (translated by Norman Walker). Edinburgh.
Urbach, E., Le Winn, E. B. (1946) Skin Diseases, Nutrition and Metabolism. London.
Valsalva, A. M. (1707) De Aure Humane Tractatus. Utrecht.
Velschius, G. M. (1674) Quoted in Hoefle's Exercitatio de vena medinensi ad mentem Ebn-Sinae, &c. Augsburg.
Vignes, M. (1937) Maladies des femmes enceintes. Paris; vol. iii, p. 148.
Way, S. C., Andrews, G. C. (1950) *Arch. Derm. Syph., Chicago*, **61**, 575.
Weidman, F. D. (1940) *Ibid*, **42**, 604.
Wheatley, V. R. (1956) Personal communication.
Wiener, K. (1955) Systemic Associations and Treatment of Skin Diseases. London.
Wile, U. J., Barney, B. F., Bradbury, J. T. (1939) *Arch. Derm. Syph., Chicago*, **39**, 195.
— Snow, J. S., Bradbury, J. T. (1939) *Ibid*, **39**, 200.
Willan, R. (1808) On Cutaneous Diseases. London; vol. i.
Wilson, E. (1842) Diseases of the Skin. London.
— (1847) *Ibid*. 2nd ed., London.
Zuckerman, S. (1940) *Biol. Rev.* **15**, 231.

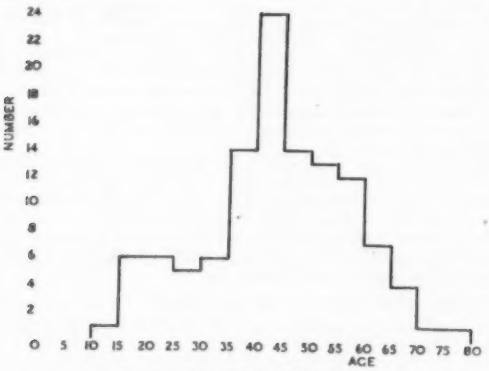


Fig. 2—Age-distribution in 5-year periods.

Indications for Surgery

Pressure symptoms are an indication for surgery, and pressure signs—e.g., dilated cervical veins and stridor—are, of course, an even more compelling indication.

The surgeon should be experienced in surgery of the thyroid gland and be aware not only of his capabilities but also of his limitations. Confronted with a recurrent goitre he should be able to decide in most cases, from clinical examination, whether the proposed operation in the particular case would be comparatively easy or difficult. If easy, surgery is recommended; but, if difficult, the case is again reviewed, and in the presence of other contra-indications—e.g., damage to a recurrent laryngeal nerve, a history of postoperative tetany, and cardiovascular involvement—treatment with radioactive iodine is seriously considered.

Indication for Radioactive-iodine Therapy

A combination of a technically difficult procedure and a patient with a low cardiac reserve is a definite indication for treatment with radioactive iodine.

Review

In the same period in which the 101 patients with recurrent goitre were operated on, 1603 thyroidectomies were done in the unit (6·3%). Of the 101 goitres 11 had previously been operated on at this unit (1 of them recurred twice), giving a recurrence-rate of 0·7% for the unit.

Of the 101 recurrences 89 were in women.

The age-distribution in five-year periods is shown in fig. 2.

The intervals between the original and the present operations are shown, also in five-year periods, in fig. 3. A woman, aged 73, had her original thyroidectomy done by Sir James Berry in 1897; she had a large recurrence extending into the posterior mediastinum and causing pressure symptoms.

88 had had one previous thyroidectomy, 11 two, and 2 three previous thyroidectomies.

20% of the patients with recurrences had had their original operations in countries other than the United Kingdom.

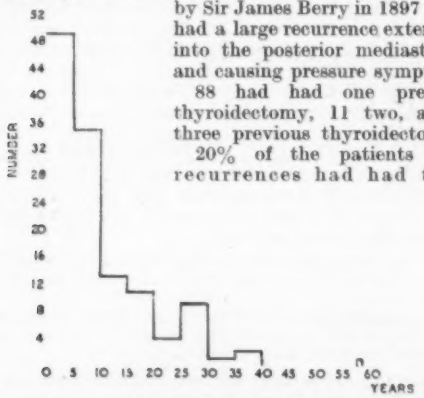


Fig. 3—Interval between operations in 5-year periods.

Just under 33% gave a family history of goitre.

About a third of the 101 patients were considered to be clinically toxic, half of these requiring only iodine preparation and the other half an anti-thyroid drug.

On routine preoperative laryngoscopy 12 patients (11·9%) were found to have a paralysed vocal cord, and on postoperative laryngoscopy a further 3 were found to have sustained paralysis of a vocal cord.

About half the recurrences were bilateral and half unilateral.

At operation, the inferior thyroid artery was examined whenever possible: in 12 bilateral recurrences the arteries on both sides were found intact and were ligated; in 12 other bilateral recurrences intact arteries were found on only one side; and in 34 unilateral recurrences the intact artery was found on the affected side. Thus 57% of these patients had not had their inferior thyroid arteries ligated at the original operation.

20% of the recurrences were of the diffuse toxic type, the remainder being of the nodular variety, either toxic or non-toxic.

Pressure symptoms were one of the main indications for operation in just under 60%.

None of these patients died.

Operative Technique

The scar is always excised, except when the original incision has been badly sited and will not give adequate exposure. It is our practice to undercut the skin obliquely, excising fibrous tissue. This allows more accurate approximation of the skin in finally suturing and often produces a hair-line scar.

Careful examination of the neck is essential before the operation. If palpation reveals that the recurrence has an intact isthmus, the normal approach, with reflection of flaps and midline split of the strap muscles, is used. If, however, the trachea was obviously bared at the initial operation, we approach the recurrence, after reflecting the flaps in the usual way, whether the recurrence is unilateral or bilateral, more directly through an oblique incision of the deep fascia in front of the anterior border of the sternomastoid muscle. In using this approach it should be remembered that the internal jugular vein is in danger of being damaged because it is usually plastered and flattened on to the recurrence by fibrosis and adhesions following the first operation. Planes of cleavage are sought; but, since these are usually obliterated as a result of the previous operation, we invariably resort to dissection with scissors. An absolute knowledge of the anatomy of the area is essential in this procedure. The finding of a clean cleavage plane without adhesions is eloquent evidence that the lobe had not been explored at the previous operation. It is a general rule that the more adequate the first operation the more fibrosis, with loss of cleavage planes, is found at the subsequent operation.

The recurrent lobes having been exposed and delivered, the recurrence is removed in the usual way, the greatest care being taken to preserve the recurrent laryngeal nerve and the parathyroid glands and to avoid injuring the trachea and œsophagus.

The field of operation is invariably drained.

Discussion

From our experience of operating on these cases certain facts emerge which to us seem very important in the prevention of recurrence. Many of the so-called recurrences are not recurrences at all but simply the continued growth of adenomatous tissue left behind after an inadequate operation.

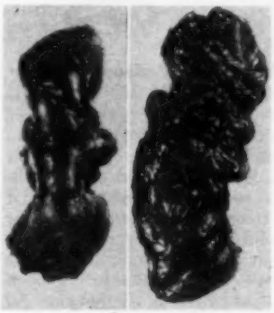
Furthermore, operation revealed that, although in many cases the initial operation appeared to have been entirely satisfactory on one side, the opposite side had not been exposed. This appeared to be so in at least 24 of the cases.

A more detailed report of our own recurrences is perhaps more instructive :

Case 1.—A girl, aged 16, underwent thyroidectomy for mildly toxic nodular goitre in June, 1951. She was operated on for bilateral recurrence in November, 1953. Microscopy showed the recurrence to be so atypical that it was regarded as malignant ; so the remaining thyroid tissue was destroyed by radioactive iodine.

Probable reason for recurrence : malignant change.

Case 2.—A woman, aged 58, underwent thyroidectomy for nodular goitre in July, 1951. The right lobe was a large cystic mass ; the left lobe was intact except for the lower pole, which was nodular. In November, 1952, a pyramidal recurrence was removed (fig. 4), and in August, 1953, a left recurrence was removed.



a b

Fig. 4—Pyramidal recurrence : *a*, anteroposterior view ; *b*, section (actual size).

Probable reasons for recurrences : pyramidal lobe not removed at original operation, and left inferior thyroid artery not ligated at original operation.

Case 3.—A woman, aged 42, was operated on in 1945 at another hospital. In September, 1952, a bilateral recurrence with bilateral retrosternal projections was removed, and in August, 1953, an enlarged pyramidal lobe was removed.

Reason for recurrence : non-removal of pyramidal lobe.

Case 4.—A woman, aged 22, underwent thyroidectomy at another hospital in 1942. In 1947 a right recurrence was removed at this unit, microscopy revealing a malignant adenoma. In February, 1953, a left recurrence was removed and the left inferior thyroid artery was ligated. Microscopy again suggested malignancy. There being no uptake of radioactive iodine, the patient is being kept under observation.

Reasons for recurrences : malignant change.

Case 5.—A woman, aged 26, had her bilateral lobulated thyroid gland removed and both inferior thyroid arteries ligated in July, 1949. In November, 1953, she had a bilateral recurrence removed.

Probable reason for recurrence : inadequate operation.

Case 6.—A woman, aged 54, underwent thyroidectomy for a toxic nodular goitre, both inferior thyroid arteries being ligated, in November, 1949. In November, 1953, a pyramidal mass was removed.

Reason for recurrence : pyramidal lobe not removed at first operation,

Case 7.—A woman, aged 50, underwent thyroidectomy for diffuse toxic goitre, both inferior vessels being ligated, in May, 1950. In 1952 she had a recurrence of symptoms, but no goitre was palpable. She was treated with radioactive iodine.

Probable reason for recurrence : constitutional.

Case 8.—A woman, aged 46, underwent thyroidectomy for diffuse toxic gland, both inferior thyroid arteries being ligated, in December, 1950. In October, 1954, she had a second operation for bilateral recurrence.

Probable reason for recurrence : inadequate operation.

Case 9.—A man, aged 21, had an operation for toxic goitre, only the left inferior thyroid artery being ligated, in October, 1947. In July, 1954, he had an operation for bilateral recurrence, and the right inferior thyroid artery was ligated.

Probable reasons for recurrence : inadequate operation and omission to ligate inferior vessel.

Case 10.—A man, aged 40, had a mildly toxic nodular goitre removed in March, 1945. In April, 1955, a bilateral regrowth was removed.

Probable reason for recurrence : inadequate operation.

Case 11.—A woman, aged 55, underwent thyroidectomy in 1944. In March, 1956, a left-sided cystadenoma was removed.

Probable reason for recurrence : inadequate operation.

Study of our own recurrences and those coming from other hospitals leads us to formulate the following principles, observance of which, we are convinced, will greatly reduce the incidence of recurrent goitre :

(1) Inspection and palpation of the whole gland.
(2) Ligation of the inferior thyroid arteries.
(3) Removal of the pyramidal lobe.
(4) Selective partial thyroidectomy.
(5) Adequate operation.
(6) Reconstitution.

Inspection and Palpation of Whole Gland

We feel that perhaps the most important single factor in recurrence is the fact that the whole gland was not inspected and palpated at the original operation. In many recurrences coming to this unit exploration reveals that either a whole lobe or its posterior aspect has not been previously explored, shown by the clean non-adherent planes, particularly on the posterolateral aspect of the regrowth. These findings have led us to believe that these so-called " recurrences " are simply the continued growth of adenomas not adequately dealt with at the first operation. On other occasions the position of the scar—e.g., a unilateral incision—would obviously not have afforded adequate exposure of the whole gland. We have often been surprised by finding at operation that both lobes were pathological when examination of the neck had suggested only a discrete adenoma or perhaps an adenomatous replacement of one side.

We therefore explore both lobes visually and digitally at every operation. This adds but little to the operating time, has no effect on the cosmetic result, and, by ensuring removal of all diseased tissue, considerably lessens the risk of recurrence.

Ligation of Inferior Thyroid Arteries

Quite apart from the question of safety, we consider that ligation of the inferior thyroid arteries is a potent factor in preventing recurrence. As mentioned above, most of the recurrences were found to be associated with non-ligation of these vessels at the original operation. Lessons from our own recurrences have strengthened this opinion.

It is the practice of this unit to ligate the inferior thyroid arteries in continuity, with unabsorbable material. Rarely is it necessary to divide the arteries between ligatures ; this is done only when an artery is tethering an adenoma or a nodular mass and making its delivery difficult.

The technique used for identifying and ligating the arteries is as follows :

The lateral thyroid veins, if present, are isolated and divided, and the operator's left index finger retracts the lobe of the thyroid medially. At the same time his assistant retracts the strap muscles, together with the internal jugular vein if accessible, laterally and slightly forwards. This manœuvre, by stretching the fascia round the carotid sheath, facilitates its further dissection.

The carotid artery is next identified and its overlying fascia boldly stripped upwards and downwards. The index finger is inserted into this cleared space and again retracts medially while the assistant further retracts laterally. In this way the

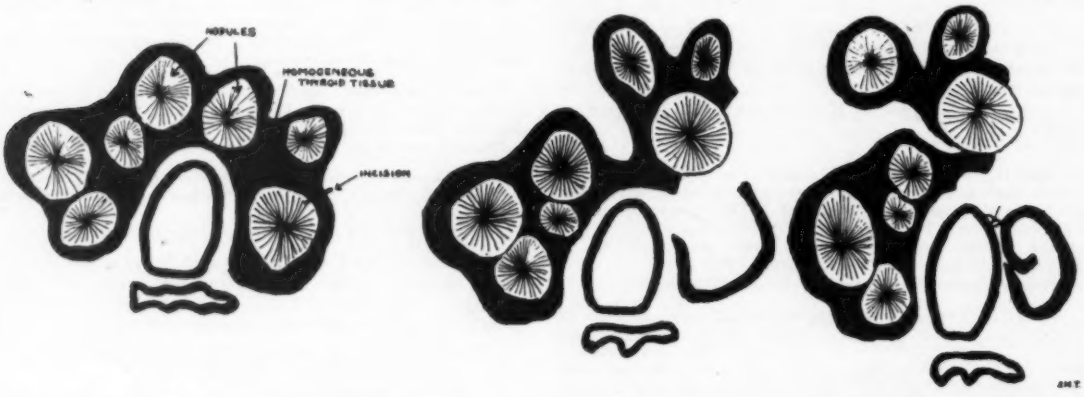


Fig. 5—Selective partial thyroidectomy: *a*, nodular goitre and line of incision; *b*, attenuated compressed normal thyroid reflected off nodular mass; *c*, remnant enfolded and sutured to tracheal fascia.

carotid artery is fully exposed together with its immediate medial relations. The inferior thyroid artery is then usually revealed tracking underneath the carotid artery. If it is not visible, palpation along the medial aspect of the carotid artery will usually discover it, and dissection over this area will expose it.

When the inferior thyroid artery has been dissected as near as possible to the carotid artery (or even posterior to it) it is underrun with the unabsorbable material and ligated in continuity. For this purpose Dunhill's ligature carrier is extremely useful.

This technique, in addition to identifying the inferior thyroid artery, also protects the recurrent laryngeal nerve: the operator's finger, in retracting the tissues medially after exposing the carotid artery, overlies and protects the nerve and prevents its injury while the artery is being dissected.

With this technique we have no reason to believe that ligation of the inferior thyroid arteries predisposes to tetany.

Removal of Pyramidal Lobe

Complete and meticulous dissection of the pyramidal lobe is an important factor in preventing recurrence. In our own series, as one of us has mentioned elsewhere (Lange 1953), the leaving behind of a portion of the pyramidal lobe often leads to a local recurrence. The removal of the great part of a gland seems to stimulate the remnants to hypertrophy.

The pyramidal lobe is present in about 75% of cases. We dissect this lobe after the left lobe has been sectioned and reflected. The blood-supply to the pyramidal lobe is fairly constant, entering the lobe near its base, usually from the left side. The vascular pedicle is easily isolated, clamped, and divided. The rest of the pyramidal lobe is then dissected distally. Since its tip often extends to the retrohyoid area, it is essential to have the vertical midline split of the strap muscles extended sufficiently high and to have adequate retraction. The pyramidal lobe is gradually dissected free, often up to the under surface of the hyoid bone, there being very little blood-supply other than that mentioned above. The tip is blunt or occasionally bulbous and, when it has been reached, may be gently avulsed with safety because no vessels enter or leave it. This procedure may add a few minutes to the operating time but is well worth while because it helps to prevent recurrence.

Selective Partial Thyroidectomy

Over the past few years at this unit a technique of selective partial thyroidectomy has been evolved. Briefly, all obviously pathological (nodular) tissue is removed; in other words, an adequate operation is effected. This technique does not apply to diffuse goitre, usually toxic, because the whole gland is diffusely involved and the portion to be left behind is easily selected; but it applies particularly to the multinodular type of goitre.

In colloid or puberal goitre, any nodules are deeply placed and there is an easily identifiable surrounding zone, of variable thickness, consisting of comparatively normal secreting thyroid tissue. In the well-established nodular goitre this zone, though perhaps very attenuated, can invariably be identified. The main aim of the technique is to reflect this zone of secreting tissue from off the nodules and to preserve it, even though the remnants may consist entirely of this attenuated compressed tissue. This technique ensures that all the diseased tissue,

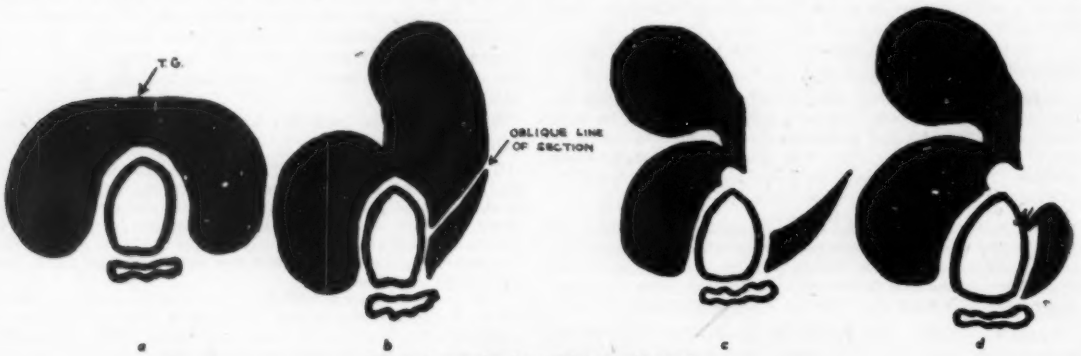


Fig. 6—Reconstitution: T.G., thyroid gland.

at least all which is obvious to the naked eye, is removed, and that the remnants are secretory—to be stimulated, if necessary, by the thyrotropic hormone of the pituitary.

In operating on nodular goitres it is often found that the upper poles have escaped the nodular process and consist of soft homogeneous secreting thyroid tissue. In these cases, particularly when toxicity is minimal or absent, we never hesitate to leave behind the upper poles.

This technique has been in use for some years, and it is surprising that patients in whom only very small remnants of the selected tissue had been preserved continue to be perfectly euthyroid. One can fairly assume that, provided that a little normal or nearly normal tissue remains, the pituitary gland will stimulate it to produce a sufficient amount of thyroid hormone for the patient. (Fig. 5 schematically presents the essential steps in this technique.)

Adequate Operation

Adequate operation is a sine qua non in preventing recurrence.

In operating on a diffuse toxic goitre about 1–4 g. of the posterolateral margin is left on either side. In gauging the remnants account is taken of the size of the gland, the original degree of toxicity, the reaction of the gland to the anti-thyroid drug, the patient's personality, and the presence of any cardiovascular involvement.

In operations on the nodular variety the quality of the remnants—i.e., removal of all nodular tissue—is the primary concern; the amount of gland to be left is determined by the patient's toxic state.

In cases with lymphadenoid change it must be borne in mind that myxœdema is an almost inevitable sequel (Greene 1950, 1953) irrespective of the size of the remnants. In such cases operation—e.g., for the relief of pressure symptoms—has merely anticipated the natural course of the condition.

Reconstitution

The operation is so designed that the remnants are reconstituted in such a manner as to resemble small lateral lobes. With this in view, when the lobe has been delivered and the line of section decided on, the gland is sectioned in an oblique manner, so that the remnant can be folded over and medially and, with a few fixing or anchoring sutures, can be made to nestle snugly against the lateral aspect of the trachea (fig. 6). Quite apart from the surgical neatness effected, this is also a hæmostatic procedure and ensures that the remnant is covered by its capsule, which cuts down oozing and the subsequent production of serum. We believe also that this procedure does in a small but positive way prevent recurrences, the growth of the remnant being limited by its capsule; and that, in some cases, it does away with the necessity of draining the operation site.

Summary

At the New End thyroid clinic and department of endocrinology cases of true recurrent goitre amounted to about two-fifths of the number of cases referred as recurrent goitre.

The commonest cause of recurrence is probably an inadequate initial operation. Most "recurrences" therefore are in fact continued growths of pathological tissue which remained after the first operation. Factors promoting recurrence are failure to ligate the inferior thyroid arteries and to remove the pyramidal lobe.

We wish to thank Staff Nurse S. M. Torkington for figs. 5 and 6; Miss E. Mason for the photographs and figs. 2 and 3; and Mrs. M. J. Lange for help with statistics.

REFERENCES

Greene, R. (1950) *J. Endocrin.* **7**, 1.
— (1953) *In* Memoirs of the Society for Endocrinology. London; vol. 1, p. 16.
Lange, M. J. (1953) *Brit. J. Surg.* **40**, 544.

THE TREATMENT OF TETRAETHYL LEAD POISONING

P. R. BOYD
M.B. Lond.
CHIEF MEDICAL OFFICER,
THE ASSOCIATED ETHYL COMPANY LTD., LONDON

G. WALKER
B.Sc., M.B. Lond., M.R.C.P.
MEDICAL REGISTRAR

I. N. HENDERSON
M.B. Lond.
HOUSE-PHYSICIAN

THE MIDDLESEX HOSPITAL

TETRAETHYL lead, $(C_2H_5)_4Pb$ (T.E.L.), a highly toxic liquid, is manufactured on a large scale, distributed throughout the world, and blended with many types of petrol; yet poisoning is rare because of the stringent precautions taken in its manufacture and handling. Recent cases have arisen sporadically in men cleaning tanks which have contained leaded petrol. Such incidents have been reported in the United Kingdom by Cassells and Dodds (1946) and Walker and Boyd (1952), in the U.S.A. by Kitzmiller et al. (1954), and in Germany by Fischer (1950) and Muller (1953).

This organo-metal compound is absorbed through the skin and the respiratory and alimentary mucosæ; it is probably distributed in a non-ionic form and being lipoid-soluble, is concentrated in the brain, body fat and liver (Kehoe and Thamann 1931). Its toxicity is due to its lead content (Kehoe 1927) and because of selective uptake manifestations of poisoning are dominated by involvement of the central nervous system and differ from those of inorganic lead poisoning where the initial lead distribution is different. Although the inhalation of T.E.L. vapour for a brief period may be fatal the continued excretion of large amounts of lead in the urine for some time after the removal of symptomless workers from prolonged minor exposure, suggests that appreciable quantities of T.E.L. may be absorbed and the lead stored in a relatively non-toxic form.

The clinical picture has been described in detail by Machle (1935) and Kehoe (1925). Mild intoxication causes headache, irritability, restlessness, anxiety, fatigue, insomnia with bad dreams and minor gastro-intestinal symptoms, including anorexia, vomiting and diarrhœa. There is sometimes a persistent metallic taste. These symptoms may easily be mistaken for those of an anxiety state. In more severe intoxication there is a similar "prodromal" stage lasting a week or more, followed by a toxic psychosis, the pattern of which depends on the patient's underlying personality and is remarkably variable from individual to individual and sometimes from day to day. Hallucinations, delusions and intense fear are usual and suicidal attempts not infrequent. Coma and convulsions occur in the most severe cases. Physical signs are few, the most important being tremor, increased tendon-reflexes, hypothermia, bradycardia hypotension and loss of weight. The classical signs of inorganic lead poisoning are not found. Relapses are common, but chronic effects and permanent sequelæ have not been reported. The diagnosis is confirmed by estimations of the urinary lead excretion but blood-lead levels are seldom much increased.

Small hæmorrhages may be found in the meninges, brain and the gastro-intestinal tract, but there are no characteristic necropsy findings.

Three moderately severe cases are described in this report and the effect on lead excretion of edathamil calcium disodium (edathamil $CaNa_2$; 'Versene'), given intravenously and orally, and of penicillamine given orally are compared. A fourth case with a severe psychosis is mentioned, but the severity of the illness prevented detailed biochemical observation.

The Outbreak

In March and April, 1956, a team of five men worked for 6 weeks cleaning underground tanks which had contained leaded petrol. Four men (cases 1–4) who worked in the tanks were admitted to hospital suffering from tetraethyl lead poisoning. The fifth man, who remained on the surface, showed neither clinical nor biochemical evidence of poisoning.

The affected men scraped the deposit containing tetraethyl lead from the floors and sides of the tank, and shovelled it into buckets, which were hauled to the surface and emptied into pits. They were provided with protective clothing and equipment designed to protect against fluid and vapour, consisting of oilskin suits and hats, rubber boots and gloves, and a face-mask with a positive-pressure air-line. For various reasons they neglected the strict precautions laid down for this type of work.

The following investigations were performed in cases 1–3 on admission :

Hæmoglobin and red-cell count ; examination of red cells for stippling ; total and differential white count. Liver-function tests, including cephalin-cholesterol and zinc sulphate flocculation, and thymol turbidity tests ; estimation of serum albumin and globulin ; electrophoresis of serum-proteins ; estimation of prothrombin content, and serum-bilirubin. Blood-urea. Urine deposit and routine estimation for protein, reducing substances and excess urobilinogen. Electro-encephalogram. Chest X rays and films of the upper abdomen for assessment of the density of the liver shadow. In every case the results of these tests were normal.

During the period in hospital urine was collected daily for estimation of lead, coproporphyrin and creatinine. In addition lead analysis was performed on daily fæcal samples and on blood samples taken frequently.

The urine and fæces were passed directly into lead-free glass bottles and were collected over 24-hour periods. Blood (20 ml. clotted) was collected into special all-glass syringes and when edathamil $CaNa_2$ was given intravenously the sample was taken immediately before the infusion. The lead concentrations in urine, fæces and blood were estimated by modifications of the methods of Bambach and Burkey (1942) which give the following approximate values for non-exposed men : urine 50–100 μg. daily, fæces 20–400 μg. daily, and blood 10–60 μg. per 100 g. Coproporphyrin III was extracted from urine samples by a method based on that of Schwartz et al. (1951) and then determined spectrophotometrically in a manner similar to that described by Rimington and Sveinsson (1950), (Normal=about 0–50 μg. daily.) Urinary creatinine was estimated by the Jaffe reaction.

In cases 1–3 the men were treated in turn for 3-day periods with edathamil $CaNa_2$, 1 g. per 30 lb. body-weight per day by intravenous infusion, lasting 4–6 hours ; with penicillamine 300 mg. t.d.s. by mouth and with edathamil $CaNa_2$ 1 g. q.i.d. by mouth. In each case treatment was preceded by 2 control days during which urine, fæces and blood were collected for analysis and intervals of several days were allowed between the different forms of treatment.

The men were confined to bed for the first few days and sedated as necessary with amylobarbitone in doses from gr. $^3/_4$ t.d.s. to gr. 3 b.d., with gr. 3–6 at night. A high fluid intake and full diet were encouraged throughout.

After discharge from hospital the men were examined and further analyses were made weekly. Edathamil $CaNa_2$ 1 g. q.i.d. was given by mouth for alternate weeks until their clinical condition was satisfactory and the basal lead excretion normal. They then started work of a different kind involving no exposure to toxic hazards.

Case-reports

Case 1.—A man aged 41 had cleaned tanks, including a few which had contained leaded petrol, regularly for 10 years and was foreman of the team. He had never previously noted any ill effects.

His first symptom, dryness of the throat, appeared 3 weeks after starting work and was followed by cramps in the legs, anorexia, occasional vomiting, loss of a few pounds' weight, difficulty in falling asleep, tremor of the hands and intense anxiety about his own condition and that of the other men for whom he was responsible. On a sudden impulse he travelled 150 miles by taxi to see whether his workmates were also ill. Before admission he had been treated with small doses of phenobarbitone without effect.

On admission on May 1, 1956, he was intensely anxious ; he appeared tired but required large doses of amylobarbitone to induce sleep. Weight 165 lb. (74·8 kg.), temperature 98·4°F (36·9°C), pulse 70 per min., blood-pressure (B.P.) 125/70 mm. Hg. There was a fine tremor of the outstretched hands, but no other physical signs of disease.

Subjective improvement was apparent once he had been reassured about the condition of his workmates but he continued to show mood swings, apparently unrelated to treatment. The B.P. stabilised at 110/60.

He was discharged home after 29 days, weight 162 lb. (73·5 kg.), subjectively much improved but still complaining of a dry throat and occasional pains in the limbs. Further improvement seemed to coincide with the oral administration of edathamil $CaNa_2$ and he was symptom-free and returned to work 11 weeks after the onset of his illness.

Case 2.—A man aged 28 had worked in tanks only on this one occasion. After a month he complained of difficulty in falling asleep, nightmares, anorexia, a persistent metallic taste, intermittent diarrhœa and vomiting, retro-orbital headaches and giddiness. He had had occasional upper-abdominal pain and vomiting for the previous 2 years but had otherwise been fit.

When first seen on April 30, he claimed to have lost 20 lb. (9·1 kg.) during the previous 6 weeks. He was anxious but not excited and he had no tremor. His weight was 162 lb. (73·5 kg.), B.P. 110/75. As his symptoms persisted, he was admitted to hospital on May 9, when he weighed 161 lb. (73·0 kg.), temperature 98·2°F (36·8°C), pulse 60, B.P. 120/75. A barium-meal examination showed nothing abnormal and the fæces were persistently negative for occult blood.

Throughout his stay in hospital he was alternately elated and depressed and suffered from occasional attacks of upper-abdominal discomfort, vomiting and diarrhœa, apparently unrelated to treatment. His B.P. stabilised at 100/60. He was discharged home on June 2, but readmitted 2 days later because of further vomiting which rapidly subsided with antacids and a bland diet. He was finally discharged on June 9, weighing 158 lb. (71·7 kg.).

Between June 9 and July 30 he was given two 7-day courses of oral edathamil $CaNa_2$. He abandoned the first after 4 days because of abdominal pain and diarrhœa. The second course was uneventful. At this time his B.P. was 115/70 and his weight had risen to 170 lb. (77·1 kg.). Apart from occasional headache he was symptom-free on July 30 when he started work after 11 weeks' illness.

Case 3.—A man aged 25 had also worked inside tanks for only 6 weeks. When seen on April 30 he complained only of insomnia but by May 10 he looked pale and thinner and complained of irritability, impairment of concentration, loss of libido, headache, occasional auditory hallucinations, anorexia, nausea, abdominal discomfort, vomiting and loss of a few pounds' weight.

On admission on May 17, he appeared anxious. His weight was 146 lb. (66·2 kg.), temperature 97·8°F (36·5°C), pulse 64, B.P. 95/65. Improvement was gradual and initially seemed unrelated to treatment. He was worried most by his memory-defect. Formal testing showed an average intelligence and suggested a good prognosis for recovery, which was subsequently justified. He was discharged home on June 3, weighing 148 lb. (67·1 kg.), and was given three 7-day courses of oral edathamil $CaNa_2$ during which he said he felt particularly well. He was symptom-free and began work on July 10, when his B.P. was 110/55 and his weight had risen to 150 lb. (68·0 kg.).

Case 4.—A man aged 31 had worked intermittently in leaded petrol tanks for about a year. When first seen on April 30 he strongly denied any symptoms but his blood-pressure was 95/70 and he had a slight tremor of the hands. He was known to have been a heavy drinker and to have suffered violent mood-swings in the past.

He was admitted to hospital on May 7 complaining of dizziness, confusion, and insomnia and was said to have lost consciousness for a few minutes some days previously. He

was restless and resisted examination. His B.P. was 90/60 and weight 140 lb. (63·5 kg.). Amylobarbitone gr. 3–6 seemed to aggravate his restlessness and within two days he was deluded, visually and aurally hallucinated and violent.

He was transferred to a mental hospital on May 14. During the next few days he was frequently violent and appeared intermittently anxious, confused and paranoid. Drug treatment was impossible and deterioration was progressive. On May 25 he was given unmodified electroconvulsion treatment (E.C.T.), and immediately became quiet and coöperative and for the first time had an adequate intake of food and fluids. B.P. was 85/55 immediately after this treatment. He slept well. Edathamil $CaNa_2$ was given intravenously on the next 2 days but on the 3rd day he again became restless and was given a second treatment with E.C.T., after which he remained lucid and rational. He was given infusions of edathamil $CaNa_2$ on the next 3 days with further improvement.

He was discharged from hospital on June 5 and was given three courses of oral edathamil $CaNa_2$ on alternate weeks, at the end of which his daily urine lead excretion was within normal limits. At this time (July 23) his B.P. had risen to 110/70 and his weight to 150 lb. (68·0 kg.). He was, however, still showing signs of a mild depression as well as certain paranoid traits and was therefore given six further treatments of E.C.T. between Aug. 15 and Sept. 18, with the object of preventing these forming any ingrained pattern of conduct.

After this he improved rapidly and he resumed light work on Oct. 9. His illness lasted about 6 months.

TABLE I—DAILY OUTPUT OF LEAD IN μG. IN URINE AND FÆCES

Treatment	—	Case 1		Case 2		Case 3	
		Urine	Fæces	Urine	Fæces	Urine	Fæces
Before treatment		657	1440	227	560	310	1060
		718	560	314	520	133	360
	Mean	688	1000	270	540	222	710
Intravenous edathamil $CaNa_2$		4380	2280	2456	280	942	720
		2991	1220	1956	400	3304	300
		2212	1260	1906	48	1551	548
	Mean	3194	1587	2106	243	1932	523
Interval		1270	520	761	560	838	760
		794	1120	447	560	638	200
		905	940	416	280	..	..
		...	...	412	1960	...	...
	Mean	990	860	509	840	738	480
Penicillamine		2271	1720	511	..	609	420
		1119	620	463	170	774	400
		992	310	412	560	680	260
	Mean	1461	883	462	365	688	360
Interval		...	...	455	..	...	...
		836	740	167	..	510	360
		669	370	428	...	..	..
		..	..	394	660	..	..
		..	..	536	310	..	..
		...	...	468	320	...	...
	Mean	753	555	408	430	510	360
Oral edathamil $CaNa_2$		275	1600	619	720	960	250
		1807	440	735	90	454	280
		973	800	744	...	664	280
	Mean	1018	947	699	405	693	270
Interval		1309	560	163	1320	..	..
		1072	1080	1126	220	..	..
		845	680	240	456	...	...
		...	...	221	...	989	180
	Mean	1075	773	437	665	989	180
Intravenous edathamil $CaNa_2$		1291	..	925	..	1683	..
		2228	..	...	..	...	..
	Mean	1759	..	925	..	1683	..

In each case the figures given are in daily chronological order.

Effects of Treatment

Table I shows that, though the urinary and fæcal lead excretion before treatment was greater than normal, the ratio between the two was about the same as in non-exposed persons excreting normal amounts of lead. The variation in lead excretion before treatment is to be expected, as many factors influence lead output. Creatinine estimations confirmed the accuracy of the urine collection. (Note: In correlating urinary and fæcal lead excretion for a 24-hour period, the urine figures for that period were allied to the fæcal figures for the following period.)

TABLE II—DAILY EXCRETION OF LEAD IN μG.

Case	Urine	Fæces	Total
1	557	170	727
2	99	100	199
3	391	250	641
4	133	190	323

Of the three cases studied fully, the highest lead excretion was found in the man (case 1) who had been exposed to tetraethyl lead the longest, but had not previously suffered from symptoms of poisoning. Before treatment his mean daily excretion was 1688 μg. (urine 688 μg., fæces 1000 μg.) compared with 810 μg. (urine 270 μg., fæces 540 μg.) in case 2, and 932 μg. (urine 222 μg., fæces 710 μg.) in case 3, in both of which the symptoms were no less severe. Data on case 4 are scanty because of the nature and severity of the illness in this case but the mean daily excretion before treatment was 5123 μg. (urine 789 μg., fæces 4334 μg.).

In case 1, lead excretion continued at a relatively greater rate than in the others, during and between the periods of treatment, and by July 9, about 2 months after treatment was first started and immediately following a week's course of oral edathamil $CaNa_2$, the excretion in each case had fallen as shown in table II.

This suggests that in case 1 a large amount of tetraethyl lead had been absorbed over a long period (he had been exposed to it intermittently for 10 years) and that much of the lead had been stored in a relatively non-toxic form, whereas in case 4 a smaller amount of tetraethyl lead had been absorbed over a short period (he was exposed to it for only 6 weeks), but he suffered severe poisoning because the rate of absorption much exceeded that of degradation and excretion.

The greater excretion of lead on the first day compared with the subsequent days of the periods between treatments was presumably due to a residual effect of the drugs and this also explains why the lead excretion was greater in these periods than before treatment.

Table III and figs. 1 and 2 show that intravenous edathamil $CaNa_2$ (1 g. per 30 lb. body-weight) increased the urinary lead excretion sevenfold and the total excretion threefold, whilst oral edathamil $CaNa_2$ and

TABLE III—EXCRETION OF LEAD AFTER TREATMENT, EXPRESSED AS PERCENTAGE OF PRE-TREATMENT FIGURE

Treatment	Case	Urine	Fæces	Total
Before treatment	Mean	100	100	100
Intravenous edathamil $CaNa_2$	1	464	159	283
	2	780	45	290
	3	870	74	263
	Mean	705	93	279
Interval	1	144	86	110
	2	189	136	167
	3	332	68	131
	Mean	222	103	136
Penicillamine	1	212	88	139
	2	171	68	102
	3	310	51	112
	Mean	231	69	118
Interval	1	109	55	77
	2	151	80	103
	3	230	51	93
	Mean	163	62	91
Oral edathamil $CaNa_2$	1	148	95	116
	2	259	75	136
	3	312	38	103
	Mean	240	69	118
Interval	1	156	77	109
	2	162	123	136
	3	445	25	125
	Mean	254	75	123
Intravenous edathamil $CaNa_2$	1	256	..	..
	2	343	..	..
	3	758	..	..
	Mean	452	..	..

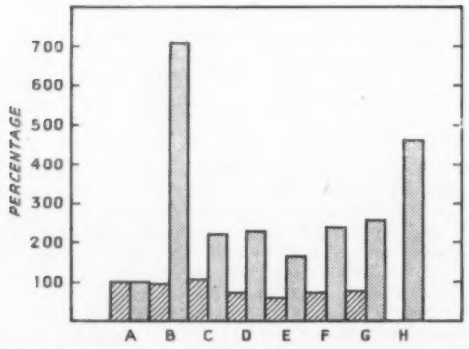


Fig. 1—Total mean excretion of lead in cases 1, 2, and 3 after treatment, expressed as percentage of total mean excretion before treatment. Stippled: in urine. Hatched: in fæces. A, before treatment; B, intravenous edathamil; C, interval; D, penicillamine; E, interval; F, oral edathamil; G, interval; H, intravenous edathamil (1 day).

penicillamine had much less effect. No drug affected the fæcal lead excretion, which fell progressively.

There was no change in the blood-lead content as a result of treatment in cases 1, 2, and 3, where the mean blood-lead figures on admission were 51, 63, and 56 μg. per 100 g. respectively. The highest values were found in case 4 (on admission 86, 89, and 89 μg. per 100 g. on consecutive days) and within a month the level had fallen to 50–60 μg. per 100 g.

The urinary coproporphyrin excretion was very variable from individual to individual and from day to day. The mean pre-treatment levels in cases 1, 2, and 3 were 12, 46, and 13 μg. per day and there was no significant change during or as a result of treatment. Before treatment there was a mean excretion of 142 μg. per day in case 4, which fell to 30–60 μg. per day within a month.

Subjective improvement in cases 1, 2, and 3 was gradual but punctuated by mood swings and occasional emotional outbursts. After discharge all but one of the men said that they felt better when taking edathamil $CaNa_2$ by mouth but there was no other correlation between treatment and the relief of symptoms. The exception (case 2) complained that the abdominal discomfort and diarrhœa from which he had suffered periodically for 2 years was aggravated by oral edathamil $CaNa_2$. No other symptoms referable to treatment were noted. No patient showed any desire to commit suicide.

Discussion

The treatment of tetraethyl lead poisoning should protect the patient against the ill effects of the substance and hasten his recovery by increasing the excretion of lead in a non-toxic form.

All but the very mildest cases should be admitted to hospital. Good nursing is essential to maintain hydration and nutrition and physical restraint may be necessary because of violence or suicidal attempts.

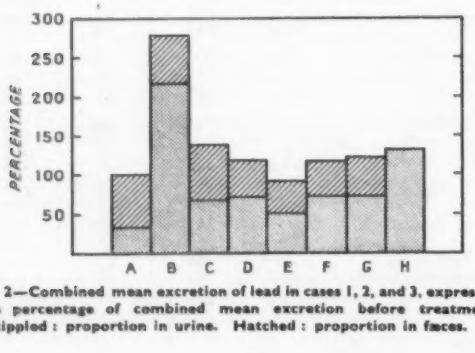


Fig. 2—Combined mean excretion of lead in cases 1, 2, and 3, expressed as percentage of combined mean excretion before treatment. Stippled: proportion in urine. Hatched: proportion in fæces.

Sedation with barbiturates is usually adequate in mild cases (cf. cases 1 to 3), but in more severe cases it may aggravate the confusion and restlessness which become worse as the dose is increased in an attempt to control them. In case 4 the patient was upset in this way by amylobarbitone in doses as small as gr. 3. He tolerated paraldehyde by intramuscular injection much better.

Means of Increasing Lead Excretion

Dimercaprol (B.A.L.) and edathamil $CaNa_2$ are the only drugs available which effectively increase lead excretion and are suitable for clinical use. They have been used extensively in inorganic lead poisoning and of the two, edathamil $CaNa_2$ is the less toxic and more effective. Little is known of their value in tetraethyl lead poisoning.

Though dimercaprol causes a transient increase in urinary lead excretion and a fall in blood-lead level (the latter apparently by transfer to muscle and bone), which may relieve the symptoms of chronic inorganic lead poisoning, its frequent side-effects—particularly nausea, vasomotor symptoms and pain and necrosis at the site of injection—detract considerably from its value (Ryder et al. 1947). Further, Graham and Hood (1948) have shown in animals and Vigliani and Zurlo (1951) in man, that it may aggravate acute poisoning. Kehoe (personal communication 1951) and Kitzmiller et al. (1954) do not regard it as valuable in the treatment of tetraethyl lead poisoning and we did not think its use was warranted.

Edathamil calcium disodium is the monocalcium disodium complex of ethylene diamine tetraacetic acid (edathamil, E.D.T.A., versene), a chelating agent which combines with metallic ions forming non-ionised, biologically inactive compounds. Metals are displaced from the complexes by heavier metals. In clinical practice the monocalcium disodium complex of edathamil is used to avoid reduction of the ionised serum-calcium and it is the calcium atoms which are exchanged for those of heavier metals.

Edathamil $CaNa_2$ has revolutionised the treatment of inorganic lead poisoning. Most workers (Hardy et al. 1954, Giles et al. 1955, Wade and Burnum 1955) have given the drug intravenously in doses up to 1 g. per 30 lb. body-weight per day. Symptomatic relief is rapid. Colic disappears in a few hours (Marcus and Spencer 1955). The urinary lead excretion increases and is usually maximal on the first day of treatment, as in our cases of tetraethyl lead poisoning. Side-effects are uncommon but include malaise, joint pains and light-headedness.

Little work has been published on oral administration but Sidbury et al. (1953) demonstrated a fivefold to tenfold increase in urinary excretion in inorganic lead poisoning and mentioned abdominal pain and diarrhœa as a side-effect. One of our patients, who had suffered from occasional abdominal pain and diarrhœa for 2 years, attributed an episode to oral edathamil $CaNa_2$.

Nothing has been published in the British literature and the only report from America on the treatment of tetraethyl lead poisoning with edathamil $CaNa_2$ is that of Kitzmiller et al. (1954), who treated three cases by intravenous infusion. As in our experience and in contrast to that in inorganic lead poisoning, improvement was not dramatic and the increase in urinary lead excretion was relatively less than that found in inorganic lead poisoning. Unfortunately detailed comparison between their results and ours is impossible because they collected only random urine and no fæcal samples.

Penicillamine (ββ dimethyl cysteine), like dimercaprol, contains 2 thiol (—SH) groups per molecule. Walshe (1956) has shown that it increases the urinary excretion of copper in normal subjects and that in patients with hepatolenticular degeneration it does so as effectively as dimercaprol in doses containing equivalent amounts of

sulphur. The drug is given orally (300 mg. t.d.s.) and is apparently non-toxic. It was given in these cases to see whether it would increase lead excretion without side-effects. There was little effect on lead excretion but no toxicity.

The Psychiatric Side

The illnesses of our patients agreed closely with the descriptions of Machle (1935) and Kehoe (1925) and the manifestations were coloured by their underlying personalities. In cases 1 and 3 the patients had stable personalities and a sense of responsibility. They were worried by their illness, the first because he was responsible for the work and safety of the team and the third because he had to support a wife and young children. The other two were unmarried and irresponsible. The fourth patient in particular was known to drink heavily and to have been excitable. He absorbed a considerable amount of tetraethyl lead over a short period and his intense excitement and violence were probably conditioned by his cyclothymic personality and aggravated by withdrawal of alcohol. He was deliberately not given alcohol because this may further aggravate the toxic effects of tetraethyl lead. It is probably significant that his "black-out" before admission occurred in a public house although he had been warned not to take alcohol.

E.C.T.—Although Roth and Rosie (1953) have reported that E.C.T. may produce striking improvement in toxic psychoses when the underlying cause has been treated, we know of no previous work on the effects of E.C.T. in tetraethyl lead poisoning. The response of case 4 was dramatic. If other severely ill patients benefit in the same way, the problems of management and treatment would be simplified and mortality would probably be reduced.

Summary

Four non-fatal cases of tetraethyl lead poisoning are described. The urinary lead excretion of the three studied in detail was increased sevenfold by edathamil $CaNa_2$ given intravenously, but little affected by edathamil $CaNa_2$ or by penicillamine by mouth. One patient who was maniacal, hallucinated and deluded responded dramatically to electroconvulsion therapy.

We wish to thank Dr. J. D. N. Nabarro for permission to study the patients, who were admitted under his care; Dr. E. L. Udwin, who undertook the care of case 4 at Horton Hospital; Dr. M. Chapman, who gave the intravenous infusions and assisted in the collection of samples; Dr. J. M. Walshe, who provided the penicillamine; Dr. G. Harrison, under whose direction the lead and coproporphyrin estimations were performed in the laboratory of the Associated Ethyl Company Limited; and the staffs of the clinical laboratories of the Courtauld Institute of Biochemistry and the Bland-Sutton Institute of Pathology of the Middlesex Hospital Medical School, who undertook other investigations and estimations.

REFERENCES

Bambach, N., Burkey, R. E. (1942) *Industr. Engng Chem. (Anal.)*, **14**, 904.
Cassells, D. A. K., Dodds, E. C. (1946) *Brit. med. J.* ii, 681.
Fischer, P. (1950) *Ztschr. ärztl. Fortbild.* **44**, 598.
Giles, H. McC., Moore, C. J., Still, B. M. (1955) *Lancet*, i, 183.
Graham, J. D. P., Hood, J. (1948) *Brit. J. Pharmacol.* **3**, 84.
Hardy, H. L., Elkins, H. B., Ruotolo, B. P. W., Quinby, J., Baker, W. H. (1954) *J. Amer. med. Ass.* **154**, 1171.
Kehoe, R. A. (1925) *Ibid*, **85**, 108.
— (1927) *J. Lab. clin. Med.* **12**, 554.
— Thamann, F. (1931) *Amer. J. Hyg.* **13**, 478.
Kitzmiller, K. V., Cholak, J., Kehoe, R. A. (1954) *Arch. industr. Hyg.* **10**, 312.
Machle, W. F. (1935) *J. Amer. med. Ass.* **105**, 578.
Marcus, A. C., Spencer, A. G. (1955) *Brit. med. J.* ii, 883.
Muller, K. (1953) *Zbl. ArbMed. ArbSchutz.* **3**, 8.
Rimington, C., Sveinsson, S. L. (1950) *Scand. J. clin. Lab. Invest.* **2**, 209.
Roth, M., Rosie, J. M. (1953) *J. ment. Sci.* **99**, 103.
Ryder, H. W., Cholak, J., Kehoe, R. A. (1947) *Science*, **106**, 63.
Schwartz, S., Zieve, L., Watson, C. J. (1951) *J. Lab. clin. Med.* **37**, 844.
Sidbury, J. B. jun., Bynum, J. C., Fetz, L. L. (1953) *Proc. Soc. exp. Biol., N.Y.* **82**, 226.
Vigliani, E. C., Zurlo, N. (1951) *Brit. J. industr. Med.* **8**, 218.
Wade, J. F., Burnum, J. F. (1955) *Ann. intern. Med.* **42**, 251.
Walker, G., Boyd, P. R. (1952) *Lancet*, ii, 467.
Walshe, J. M. (1956) *Ibid*, i, 25.

HYPOTHERMIA BY INTERNAL COOLING*

H. H. KHALIL
M.B. Alexandria, Ph.D. Lond.
LECTURER IN MEDICINE, UNIVERSITY OF ALEXANDRIA

ARTIFICIAL hypothermia was first produced in mammals by Andjus (1951), who showed that albino rats so cooled could survive prolonged respiratory and cardiac arrest. It has since been successfully used in man both as an aid to surgery (Lewis and Taufic 1953) and as an aid to anæsthesia. Any method that is used for producing hypothermia can also be used for combating hyperpyrexia.

There are at present two recognised methods of producing hypothermia: surface-cooling and extracorporeal blood-cooling.

Surface-cooling is the more widely adopted method at present. The patient's skin is cooled by putting him in cold water, a refrigerated blanket, or a box through which cold air is pumped. Although surface-cooling is easy and generally applicable, particularly to small children, it takes a lot of time, and the body-temperature is difficult to control because it continues to fall after the surface-cooling has been stopped. Delorme (1953) and Brock (1956) have criticised this method because of undesirable effects.

Extracorporeal blood-cooling was introduced by Boerema et al. (1951) and Delorme (1952). Originally blood was taken from a large artery—e.g., the femoral artery—cooled as it flowed through siliconed tubing immersed in cold water, and returned into a big vein. Later vein-to-vein blood-cooling, using the venæ cavæ, was introduced by Ross (1954). Extracorporeal blood-cooling induces hypothermia more quickly than does surface-cooling. For cardiac surgery it has the advantage that it need not be started until the heart has been examined at operation. Conversely, because it involves thoracotomy and cannulation of the venæ cavæ, it is clearly unsuitable for the other applications of hypothermia. Even in cardiac surgery it adds further trauma to the heart and chest walls, and it is known to be associated with a high incidence of arrhythmias and ventricular fibrillation during cooling and operation. Œdema of the brain has also been reported to follow the use of this technique.

The difficulties and limitations in the above-mentioned two methods of producing hypothermia suggest that a simpler and safer method would be welcomed.

Internal Cooling

Theoretical

The idea of producing hypothermia by filling the stomach with cold water in a balloon was suggested because of the rich vascularity of the gastric mucosa and the close relation of the stomach to the great blood-vessels of the abdomen and to important viscera, such as the liver. All the major vessels of the abdomen lie in the stomach bed for a considerable length of their course, and so blood passing through them may be cooled in situ without having to be pumped outside the body and then back to the patient's circulation. With each heart beat about half the arterial circulation of the body passes through the arteries lying behind the stomach, and the same volume is subsequently returned to the heart through the neighbouring veins. A temperature gradient of a fraction of a degree between the large volume of blood flowing through these great vessels and the rest of the body tissues would affect the body-temperature considerably. The large volume of blood cooled in this way at a small temperature gradient between it and the

* Adapted from a paper read at the 2nd European Congress of Cardiology at Stockholm, Sept. 11, 1956.

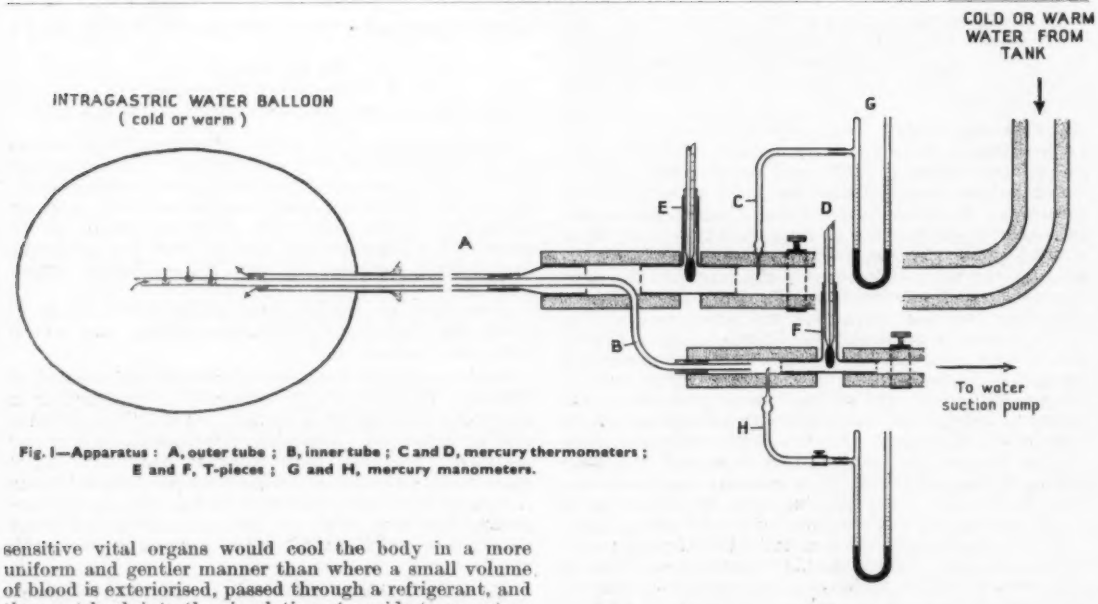


Fig. 1—Apparatus : A, outer tube ; B, inner tube ; C and D, mercury thermometers ; E and F, T-pieces ; G and H, mercury manometers.

sensitive vital organs would cool the body in a more uniform and gentler manner than where a small volume of blood is exteriorised, passed through a refrigerant, and then put back into the circulation at a wide temperature difference. Further, direct cooling of the abdominal viscera around the stomach will be an additional factor in cooling the body. This may also act by lessening the production of heat.

Experimental

In 1954 my preliminary experiments at Guy's Hospital on twenty rabbits showed that, by letting ice-cold water flow inside an intragastric balloon, the rabbits' body-temperature could be lowered from 39°C to 20°C and their heart-rate slowed from 250 to 60 beats a minute. They survived the experiment with no residual ill effects and were subsequently kept under observation for several months. Electrocardiograms during cooling showed bradycardia, prolonged conduction (P–R and Q R S) and delayed repolarisation (S–T). Arrhythmias were rare, and ventricular fibrillation was never observed. There was no obvious change in the rabbits' behaviour after these experiments, and they did not lose weight.

Clinical Trial

This technique of cooling by intragastric balloon was then tried with success on a hyperpyrexial baby (Khalil and Mac Keith 1954). This case is of particular interest because surface-cooling with ice and fans had previously been tried for six hours without success, whereas internal cooling by the intragastric cold-water balloon improved the child's condition within a few minutes. The efficiency of this technique for cooling in man was evident. It was then decided to develop a practical apparatus for changing the body-temperature by continuous infusion of cold or warm water through an intragastric balloon.

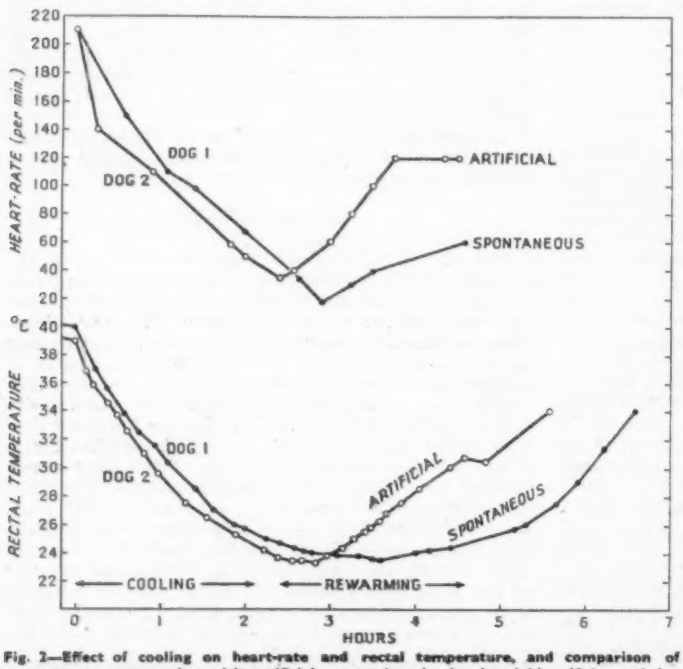


Fig. 2—Effect of cooling on heart-rate and rectal temperature, and comparison of spontaneous rewarming with artificial rewarming, in dog 1 weighing 13 kg. and dog 2 weighing 12 kg.

Materials and Methods

All the experiments were made in an air-conditioned room at 23°C. The subjects of the experiments were fourteen mongrel dogs weighing 12–20 kg. and unselected as regards age and sex. Water was stored in two 160-litre tanks 1·5 m. above the operating-table. The water in one tank was cooled by mixing it with broken ice. Cold water passed down by gravity from the tank through rubber tubing to the balloon through the outer part of a double tube made of Porges ' Neoplex ' (fig. 1, A) and left the balloon through the inner tube (fig. 1, B). The balloon used in each of these experiments was an ordinary rubber condom applied to the outer tube and with its end

surrounded by a wide rubber band to make the balloon waterproof. To ensure that the size of the balloon remained constant inside the stomach, the outlet tube was attached through rubber tubing to a water suction-pump, and the rate of water flowing to the balloon was controlled at 2 litres a minute by regulating the gravity flow from the tank and the speed of the water suction-pump. This was indirectly tested by weighing the balloon. Two sensitive thermometers (fig. 1, C and D), which had been compared beforehand, were inserted into the T-pieces (fig. 1, E and F) fixed in the rubber tubing carrying water into and out of the balloon. Two mercury manometers (fig. 1, G and H) were also connected to the two rubber tubes. The manometer H, connected to the outlet tube, was only used at intervals when the inflow of water and the suction were stopped. In the last eight experiments the electric suction-pump was out of order, and its place was taken by a tap-water suction-pump, which proved very practical and noiseless but did not return the cold water from the balloon to the tank.

Procedure

The dogs were first weighed. They were then given a fluid diet for twenty-four hours. On the day of the experiment they were only given water. Under open ether anæsthesia the dogs' tracheas were intubated. As the dogs' body-temperatures dropped, less ether was required to keep them well anæsthetised. The dogs were left to breathe ordinary air during the experiment. Since less oxygen is required in hypothermia, no artificial respiration was used, to avoid disturbing the acid-base balance by washing out carbon dioxide from the circulation. Body-temperatures were read from a mercury thermometer inserted about 10 cm. into the rectum. After a sample of gastric juice had been collected, the empty balloon was easily introduced into the stomach and filled with cold water, till it weighed about a twelfth of the dog's body-weight, with a 50-ml. two-way syringe, as used in direct transfusion. The filling of the balloon was indicated by the circumference of the abdomen, a double pneumograph (Palmer) being placed on the abdomen and connected by a Y-piece to a mercury manometer, on which the respiratory movements produced excursions of about 1 cm. Filling the intragastric balloon with water raised the level of mercury in the manometer about 5 cm. and lessened the respiratory excursions to 0·2 cm. The manometer was then disconnected and adjusted to read 0 on both sides, and this reading was maintained throughout the experiment by controlling the rate of flow of the water. In this way the size of the balloon was kept constant. The pressure in the balloon was also recorded at short intervals during the experiment by temporarily closing both inflow and outflow tubes and connecting the outflow tube to the mercury manometer (fig. 1, H). During cooling a continuous flow of cold water at 4–5°C at a rate of 2 litres a minute was maintained.

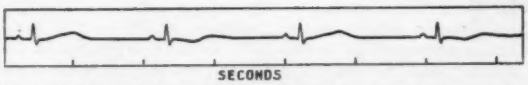


Fig. 4—Electrocardiogram showing alternation in S–T segment in lead III at 23°C.

Results

Although the intragastric balloon was filled till it weighed about a twelfth of the dog's body-weight, the epigastric region did not feel tense, and it seemed that there was room for more water. Possibly part of the balloon may have passed through the pylorus to the duodenum. The continuous flow of cold water inside the balloon lowered the body-temperature and slowed the heart (fig. 2) and respiration rates considerably. The fourteen unselected dogs were cooled from their normal rectal temperature of 39–40°C to one of 23·2–26°C, most of them to 23·2–24°C, and their heart-rate slowed from 210 to 40 or thereabouts (fig. 2). During cooling shivering was prevented by ether anæsthesia, which abolished the relevant reflexes. The dogs were left to themselves to rewarm, except that in the case of the last two warm water was circulated through the balloon. Without active rewarming, the rectal temperature went on falling and the heart-rate slowing (fig. 2); and dogs cooled to 25°C warmed up much more quickly than those cooled to 23·2°C. With the onset of shivering the rectal temperature and heart and respiration rates rose, at first gradually and later rapidly. The dogs became semiconscious when their rectal temperature reached 27–28°C; they could sit and move at 30°C. Once started, the return of body-temperature to normal and the recovery of consciousness were remarkably rapid, even in the dogs which were not artificially rewarmed. On the morning following the experiment, the dogs looked well and took bread and milk readily. On the next day they ate a normal diet including meat and bones. Their subsequent steady increase in weight showed that their digestive function was not impaired by the procedure.

Electrocardiograms (fig. 3) show most of the changes previously reported in hypothermia in dogs: bradycardia, prolonged conduction (P–R and Q R S), and delayed repolarisation (S–T); but arrhythmias were rare. A few ventricular extrasystoles developed at 24·5°C on two occasions but disappeared 5 minutes after warm water (35°C) had been passed through the balloon. No ventricu-

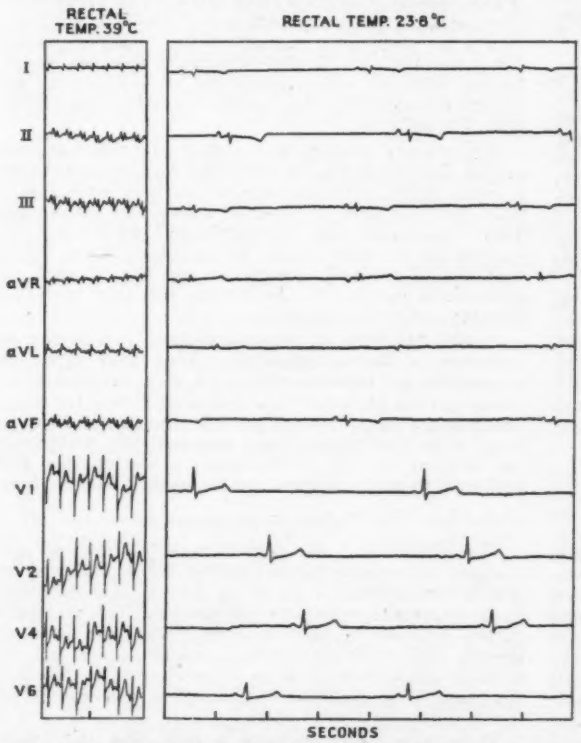


Fig. 3—Electrocardiograms of dog, with empty stomach and respirations 12 a minute, showing bradycardia, prolonged conduction (P–R and Q R S), and delayed repolarisation (S–T) at 23·8°C.

lar fibrillation developed. The injury potential described by Osborne (1953) as the precursor of ventricular fibrillation appeared at about 29°C in four experiments but did not lead to ventricular fibrillation, though some of the dogs were cooled to below 25°C for a considerable time (fig. 2). In one instance an alternation in the S–T segment appeared at 23°C (fig. 4). The same thing happened in an experiment on a rabbit at the same temperature two years ago. No adequate explanation has yet been put forward by numerous authorities who have seen the electrocardiogram.

Discussion and Conclusions

This method is best named internal cooling. It probably acts by cooling the blood in the large abdominal vessels and cooling the viscera.

The low injury potential in the electrocardiograms, the rarity of arrhythmias, and the absence of spontaneous ventricular fibrillation were striking; this may be due to a gentler and more uniform cooling. With extracorporeal cooling of the blood the heart receives cooled blood at many degrees below the body-temperature. Such cold blood does not readily give up its oxygen (Barcroft and King 1910), and this may affect the excitability and conductivity of the heart.

The absence of trauma to the heart or great vessels is another attraction to this method of internal cooling.

The organ most likely to suffer by this technique is the stomach. The gastric functions have not yet been thoroughly investigated after internal cooling, but the early return of appetite and the absence of any gross evidence of permanent gastric dysfunction are good evidence that the stomach wall tolerates the procedure. In the few dogs in which hydrochloric acid and pepsin were estimated there was no significant change a week after cooling. Certainly in man the stomach is accustomed to wide variation in the temperature of the food it receives.

Internal cooling may overcome some of the difficulties met with in current methods of producing hypothermia. It is simple, practical, and easy to manage, and has given good results in one human case of hyperpyrexia, in which surface-cooling had failed. It does not interfere with the field of operation and so can be started at any time before or during the operation. Internal cooling is almost as quick as extracorporeal cooling, and internal rewarming can be started during the operation as soon as hypothermia is no longer required. Internal cooling combines the main advantages of the two other methods; and if it proves as successful in man as it has been in dogs it may even widen the field of application of hypothermia. Intragastric cooling might be combined with intrarectal cooling or with surface cooling. Such combinations might render the process of cooling quicker and more uniform and achieve lower hypothermia with safety. Work is in progress to apply this method in man.

Summary

A new method of inducing hypothermia in dogs by circulating cold water through an intragastric rubber balloon is described.

This method was used on 14 animals and proved quite simple and practicable. The rectal temperature was brought down to 25–23°C, and the heart-rate from about 200 to about 40 per minute. All the animals recovered quickly and apparently completely. E.C.G. tracings showed a striking absence of injury potential when the rectal temperature was above 29°C. Injury potential appeared below this temperature in 4 out of 16 experiments, but it did not develop or lead to ventricular fibrillation.

I thank Prof. M. L. Dwidar for permission and facilities to conduct this work in the department of surgery, Alexandria University; Dr. R. C. Mac Keith for his encouragement and guidance; Dr. P. A. Fleming for his help in interpreting the electrocardiograms; Dr. A. S. Soliman for his help in these experiments; and Mr. M. S. Mikhail for valuable technical assistance.

REFERENCES

Andjus, R. K. (1951) *C.R. Acad. Sci., Paris*, **232**, 1591.
Barcroft, J., King, W. O. R. (1910).
Boerema, I., Wildschut, A., Schmidt, W. J. H., Broekhuysen, L. (1951) *Arch. chir. neerl.* **3**, 25.
Brock, R. (1956) *Proc. R. Soc. Med.* **49**, 347.
Delorme, E. J. (1952) *Lancet*, ii, 914.
— (1953) *Ibid*, ii, 1207.
Khalil, H. H., Mac Keith, R. (1954) *Brit. med. J.* ii, 734.
Lewis, F. J., Taufic, M. (1953) *Surgery*, **33**, 52.
Osborne, J. J. (1953) *Amer. J. Physiol.* **175**, 389.
Ross, D. N. (1954) *Lancet*, i, 1108.

THE B.C.G. LESION IN SARCOIDOSIS

PAUL FORGACS
M.D. Lond., M.R.C.P.
CONSULTANT IN DISEASES OF THE CHEST, S.E. METROPOLITAN REGIONAL HOSPITAL BOARD
C. K. MCDONALD
M.D. Edin., D.P.H.
CONSULTANT PATHOLOGIST, LEWISHAM GROUP, LONDON
M. O. SKELTON
M.B. Brist.
CONSULTANT PATHOLOGIST, LEWISHAM GROUP, LONDON

IT is widely believed that most cases of sarcoidosis represent a peculiar form of reaction to the tubercle bacillus. This supposition rests on an impressive body of circumstantial evidence, but attempts to prove it by demonstrating tubercle bacilli in the sarcoid lesion have, with a few exceptions, met with failure. One suggestion put forward to explain their absence is that the bacilli, having initiated the aggregation of histiocytes, are rapidly destroyed by them in the sarcoid follicle (Kyrle 1921, Pinner 1938).

The primary purpose of the work reported here was to test this hypothesis by observing whether attenuated tubercle bacilli of the strain B.C.G. survive, when inoculated into the skin of patients affected by sarcoidosis. This experiment also provided an opportunity to re-examine the claim made by Lemming (1940, 1942) that the histological pattern at the site of such an injection is peculiar to the disease and may therefore lend support to the diagnosis.

10 patients suffering from sarcoidosis volunteered to coöperate in the investigation. They were given an intracutaneous injection (0·1 ml.) of a suspension of B.C.G. vaccine prepared by the Danish Serum Institute, containing 0·5 mg. of bacilli per ml. The rate of development of the local reaction was recorded. Six weeks later the skin at the site of vaccination was excised and subjected to bacteriological and histological examination.

Clinical Features

The clinical and radiological manifestations of sarcoidosis, uncommon in themselves, are unlikely to be met in combination in any other disease. The diagnosis in the 10 cases reported here was based on the concurrence of two or more of these features. The prevalence of uveitis and of the intrathoracic manifestations of sarcoidosis amongst them is to be attributed to the fact that most of the patients were under the joint care of an eye hospital and a chest clinic.

There were 8 women and 2 men, and they were between 24 and 55 years of age. Uveitis was the cause of the presenting complaint in 5 cases, in all of which it was

CLINICAL FEATURES AND RESULTS OF INOCULATION

Case no.	Sex	Age	Clinical features	Mantoux test		Speed of reaction	*M. tuberculosis* grown from skin lesion	*M. tuberculosis* seen in skin lesion
				Before B.C.G.	After B.C.G.			
1	F	24	Erythema nodosum, enlarged hilar nodes	Neg. to 10 mg. O.T.	Pos. to 0·1 mg. O.T.	Delayed	+	+
2	F	37	Uveitis. Enlarged hilar nodes. Bilateral parotid enlargement	Neg. to 1 mg. O.T.	Neg. to 1 mg. O.T.	Delayed	No culture	+
3	F	52	Uveitis. Enlarged hilar nodes	Pos. to 0·1 mg. O.T.	Pos. to 0·1 mg. O.T.	Immediate	No culture	—
4	F	24	Uveitis. Enlarged hilar nodes	Neg. to 1 mg. O.T.	Neg. to 1 mg. O.T.	Delayed	+	—
5	F	31	Enlarged hilar and supraclavicular nodes	Neg. to 1 mg. O.T.	Neg. to 1 mg. O.T.	Delayed	+	—
6	F	30	Enlarged hilar and axillary nodes. Lung reticulation	Pos. to 1 mg. O.T.	Pos. to 1 mg. O.T.	Delayed	—	—
7	M	55	Uveitis, enlarged hilar nodes, reticulation of lungs. Raised plasma-globulins	Pos. to 1 mg. O.T.	Pos. to 1 mg. O.T.	Immediate	—	—
8	F	39	Enlarged hilar nodes. Lung reticulation. Raised plasma-globulins	Neg. to 1 mg. O.T.	Neg. to 1 mg. O.T.	Not recorded	+	—
9	F	50	Enlarged hilar and axillary nodes, skin lesions, lung reticulation	Pos. to 0·1 mg. O.T.	Neg. to 1 mg. O.T.	Delayed	+	—
10	M	28	Uveitis. Reticulation of lungs	Neg. to 1 mg. O.T.	Pos. to 1 mg. O.T.	Delayed	+	—

associated with symmetrical enlargement of the hilar lymph-nodes, reticulation of the lungs, or both. In addition to these findings in this group, chronic enlargement of the parotid glands was found in 1 patient and raised plasma-globulins in another. In 2 of the 5 cases of uveitis the jelly-like nodules in the iris and the large "mutton-fat" corneal precipitates were in themselves suggestive of sarcoidosis.

Amongst the other 5 patients, 3 showed the characteristic radiological pattern of symmetrical reticulation of the lungs, associated with bilateral enlargement of the hilar lymph-nodes. Of these 1 had cutaneous sarcoid lesions, confirmed by biopsy; in another the lymph-nodes in both axillæ were considerably enlarged; and in another the plasma-globulins were raised. Of the other 2 patients, one presented with erythema nodosum and symmetrical enlargement of the hilar lymph-nodes; and the other showed similar hilar appearances with a group of enlarged lymph-nodes above the left clavicle. Primary tuberculosis was excluded in both by a series of negative tuberculin tests. The salient clinical features of each case are set out in the accompanying table.

Activity of the disease was assessed by progressive change in the radiological pattern of the lungs, variation in the size of the lymph-nodes, fluctuation in the severity of the uveitis, pyrexia, or a raised sedimentation-rate. Some evidence of activity was found in each of the 10 patients at the time, or during the weeks immediately after the inoculation with B.C.G. vaccine.

Tuberculin Tests

The tuberculin sensitivity of each patient was tested with intracutaneous old tuberculin (O.T.) in doses of 0·01–1 mg., just before, and again six weeks after inoculation with B.C.G. vaccine. One patient was given an additional test with 10 mg. of O.T.

The results of the tuberculin tests are shown in the table. 6 patients were initially tuberculin-negative, and 2 of the remaining 4 gave a positive reaction only to 1 mg. of O.T. Conversion of tuberculin sensitivity six weeks after inoculation with B.C.G. vaccine occurred in only 2 of the negative reactors and no rise of sensitivity was observed amongst the initially positive reactors.

1 patient lost his tuberculin sensitivity after B.C.G. inoculation.

Development of the B.C.G. Lesion

In healthy subjects the inflammatory changes at the site of inoculation may set in within a few hours or may be delayed for several days. The delayed reaction, commonly seen in tuberculin-negative subjects, begins after an interval of five to seven days with a small area of erythema which slowly grows into a papule and ulcerates three to six weeks after inoculation. The immediate reaction on the other hand starts within twenty-four hours and progresses to an ulcerated papule in a few days. It represents the Koch phenomenon and is usual in tuberculin-positive subjects. In either event the inflammatory reaction is generally confined to the site of inoculation, though the regional lymph-nodes occasionally become enlarged.

In our series the delayed reaction was observed in 7 patients, the immediate reaction in 2, while in 1 tuberculin-negative patient the rate of development of the B.C.G. lesion was not recorded. Correlation with tuberculin sensitivity was not complete, since the reaction was delayed not only in the tuberculin-negative patients but also in 2 of the 4 initially positive reactors. The appearance of the B.C.G. lesion was identical with that seen in healthy subjects. The regional lymph-nodes were examined in 4 patients (cases 3, 7, 9, and 10) six weeks after inoculation, and were not palpable.

Histological Findings

Despite the variety of its clinical forms, the microscopic lesions in the affected tissues in sarcoidosis are essentially similar. This is the basis of the concept that the disease is a unity. The histological appearance of the sarcoid lesion is that of a sharply defined follicular structure composed of epitheloid cells. These follicles occur singly or in groups, and may show an occasional multinucleated cell of Langhans type. They do not caseate and do not appear to provoke any inflammatory reaction in the tissue in which they are found. Classically there is practically no leucocytic infiltration of a follicle other than an occasional lymphocyte.

In this investigation we found that B.C.G. vaccine produced a granulomatous lesion with an occasional follicle and Langhans giant cell, with a considerable infiltration of polymorphs and histiocytes, as well as lymphocytes. The appearances in no instance were

typical of sarcoid lesions. In 2 cases acid-fast bacilli were seen in the granulomata.

Bacteriological Investigations

In an attempt to recover the strains of organisms used for vaccination, the cutaneous nodules were excised at the end of six weeks in all cases. Part of the tissue was used for histological examination, while in 8 cases the remainder was ground up in sterile saline, treated by Jungmann's concentration method, and the deposit cultured on Löwenstein-Jensen medium. In 1 of the 2 specimens not cultured, acid-fast bacilli were seen in stained histological sections.

From 6 of these cultures a growth of *Mycobacterium tuberculosis* was obtained, morphologically and colonially identical with the original B.C.G. strains. From each of three growths a suspension of the bacilli was made in sterile saline and injected intramuscularly into a guinea-pig; one month later, in all 3 cases the animals showed a positive Mantoux reaction to 1 mg. O.T., having been previously negative.

For comparison of staining reactions, appearance, cultural characteristics, and immunising power, organisms were used (1) taken directly from fresh ampoules of B.C.G. vaccine, (2) from cultures of these on Löwenstein-Jensen medium, and (3) from cultures of swabs taken from the skin ulcers of vaccinated, non-sarcoid, tuberculin-negative subjects.

Since the guineapigs' immunological response to sarcoid-passed B.C.G. vaccination was as expected, no attempt was made to elaborate the experiment of "challenging" them with a fully virulent strain of *M. tuberculosis*.

Discussion

These observations show that attenuated tubercle bacilli survive in the skin of patients affected by sarcoidosis. They are apparently unaffected by the passage, since their form, staining properties, rate of growth, and appearance in culture, as well as their power to induce tuberculin conversion in the guineapig, were identical with those of the B.C.G. strain obtained from other sources.

It is difficult to assess how far an experiment of this type approaches the conditions under which tubercle bacilli are supposed to initiate the cutaneous manifestations of sarcoidosis. The bacilli injected were presumably far in excess of the number which might lodge in the skin by dissemination under natural conditions. On the other hand, the bacterial population is known to decrease considerably soon after vaccination (Birkhaug et al. 1949, Gernez-Rieux et al. 1950), so that for much of the time local conditions may have resembled those of a natural infection.

The survival and rate of growth of tubercle bacilli in living tissues depends upon their virulence. Mackaness et al. (1954) found the strain B.C.G. particularly vulnerable in experimental infections of the mouse and in cultures of rabbit monocytes. The monocytes of the sarcoid granuloma are credited with enhanced powers of destroying tubercle bacilli; yet, in our experiments, bacilli of low virulence, unprotected by necrotic material or fibrous tissue, managed to survive for six weeks among a collection of such cells.

The absence of enlargement of the regional lymph-nodes draining the site of vaccination deserves comment. Adenopathy is a common feature of sarcoidosis, and if the disease is in fact due to an infection, enlargement of the lymph-nodes could reasonably be attributed to invasion by the infecting organisms. 3 of the 4 cases in which the state of the lymph-nodes draining the site of vaccination was recorded had enlarged mediastinal glands, yet none of them developed palpable regional glands after vaccination. If the tubercle bacillus was responsible for the mediastinal lymphadenopathy, one might have expected the lymph-nodes on the direct path of invasion from the site of vaccination to be similarly affected.

The histological appearance of the B.C.G. lesion in sarcoidosis is not distinctive enough to be used as a diagnostic test. The pattern is that of a chronic inflammation with histiocytes and lymphocytes predominating. As might be expected in an ulcerated lesion exposed to secondary infection, polymorphonuclear cells were also common. Giant cells were not always present and never contained the inclusion bodies described in sarcoidosis. No section showed the characteristic cell arrangement of the sarcoid follicle.

Such a histological picture resembles the B.C.G. lesion in healthy tuberculin-negative subjects, described by Sagher et al. (1954), and suggests that, in many cases of sarcoidosis at any rate, the tissue response to B.C.G. conforms to the normal pattern. Bjørnstad (1948), after comparing the histology of skin lesions produced by killed human and bovine bacilli and by B.C.G. in sarcoidosis with that in healthy tuberculin-negative subjects, came to the same conclusion. The claims of Lemming (1940, 1942), Warfvinge (1945), and Schaumann and Seeberg (1948) that the histological response to B.C.G. in sarcoidosis is peculiar to this disease, could not be substantiated.

The tuberculin tests confirmed the findings of Israel et al. (1950) that failure of conversion after B.C.G. vaccination is common in sarcoidosis.

The rate of development of the B.C.G. lesion conformed in general with that of normal subjects, according to their tuberculin sensitivity. Leider and Sulzberger (1949) noted that, in 4 cases of sarcoidosis with cutaneous manifestations, the papule at the site of the B.C.G. vaccination appeared earlier than in the controls and did not progress to ulceration. In our series, including 1 patient with cutaneous nodules, the naked-eye appearance of the B.C.G. lesion was similar to that seen in healthy subjects at all stages of its development. We came to the conclusion that the histological and naked-eye appearance of the B.C.G. lesion in sarcoidosis does not help to establish the diagnosis.

Summary

Tubercle bacilli of the strain B.C.G. inoculated into the skin of patients affected by sarcoidosis can be recovered six weeks later and are unaffected by passage.

The rate of development and naked-eye and histological appearance of the B.C.G. lesion are not sufficiently distinctive to be relied on as a diagnostic test.

We wish to record our thanks to Mr. A. G. Cross for referring patients under his care at the Eye Sanatorium, Swanley, to one of us. We are also indebted to Dr. C. H. R. Knowles for his report on the skin-biopsy tissue in the first 3 cases, and to Dr. E. H. Bailey for his valuable help in the bacteriological work.

REFERENCES

Birkhauz, K., McGlynn, D., Clarke, M. E. (1952) *Proc. Soc. exp. Biol., N.Y.* **80**, 64.
Bjørnstad, R. (1948) *Acta derm.-venereol., Stockh.* **28**, 174.
Gernez-Rieux, C., Sevin, A., Verschoote, G. (1950) *Ann. Inst. Pasteur*, **3**, 103.
Israel, H. L., Sones, M., Stein, S. C., Aronson, J. D. (1950) *Amer. Rev. Tuberc.* **62**, 408.
Kyrle, M. (1921) *Arch. Derm. Syph. Berlin*, **131**, 33.
Leider, M., Sulzberger, M. B. (1949) *J. invest. Derm.* **13**, 249.
Lemming, R. (1940) *Acta med. scand.* **103**, 400.
— (1942) *Ibid*, **110**, 151.
Mackaness, G. B., Smith, N., Wells, A. Q. (1954) *Amer. Rev. Tuberc.* **69**, 479.
Pinner, M. (1938) *Ibid*, **32**, 690.
Sagher, F., Liban, E., Kocsard, F. (1954) *Arch. Derm. Syph., Chicago*, **70**, 681.
Schaumann, J., Seeberg, G. (1948) *Acta derm.-venereol., Stockh.* **28**, 158.
Warfvinge, L. E. (1945) *Nord. Med.* **27**, 1493.

PLASMA-ŒSTROGEN LEVELS
IN LATE PREGNANCY, IN THE NORMAL MENSTRUATING FEMALE, AND IN THE MALE

J. R. K. PREEDY
M.D. Camb., M.R.C.P.
RESEARCH FELLOW IN MEDICINE

ELSIE H. AITKEN
B.Sc. Glasg.
SENIOR TECHNICIAN

MEDICAL UNIT, THE LONDON HOSPITAL, LONDON

THE chemical determination of œstrogens in the blood presents serious difficulties, not only because of the minute amounts present, but also because of the presence of material which interferes with the known methods for œstrogen detection.

During the elaboration of a technique for the chemical determination of the three main œstrogens (œstrone, œstradiol-17β, and œstriol) in urine (Aitken and Preedy 1956), it appeared that the same technique could be applied to the estimation of œstrogens in the plasma of pregnancy.

Since the chemical estimation of the three œstrogens in plasma, using adequate separation techniques, has not been reported before, it may be valuable to present our findings in a small series of subjects in late pregnancy, in normal females, and in males.

Material and Methods

Six patients in normal late pregnancy were studied, together with six normal females in the luteal phase of the menstrual cycle, and five normal males.

Blood was collected, heparinised, centrifuged immediately, and the supernatant plasma separated. About 8 ml. plasma was used in the pregnancy cases, and about 18 ml. in the menstruating females and in the males. The plasma was made up to 100 ml. with water, and refluxed in 1·8-N HCl for 45 minutes. The procedure of Aitken and Preedy (1956), which involves gradient elution partition chromatography and fluorimetry, was then employed.

TABLE I—PLASMA-ŒSTROGEN LEVELS IN NORMAL LATE PREGNANCY

Case no.	Age	Week of pregnancy	Primiparous (P) or multiparous (M)	Œstrogen levels (μg. per 100 ml. plasma)		
				Œstrone	Œstradiol-17β	Œstriol
1	29	41	M	2·65	1·25	4·28
2	25	38	P	3·06	2·04	17·5
3	34	38	M	7·15	2·19	7·10
4	36	38	M	10·30	1·40	8·65
5	22	39	P	9·20	2·93	11·7
6	36	42	M	6·50	1·82	7·65

Results

Plasma-œstrogen levels in the late-pregnancy cases are given in table I. The ranges are as follows: œstrone, 2·65–10·3 μg. per 100 ml.; œstradiol-17β, 1·25–2·93 μg. per 100 ml.; œstriol, 4·28–17·5 μg. per 100 ml. A typical chromatogram from one of the pregnancy cases is shown in the figure. The peaks due to the three œstrogens are labelled; the remaining peaks are due to interfering material.

Œstrogen levels in normal menstruating females are given in table II. The levels are much lower than those in pregnancy, and in many instances are below the range that can be conveniently detected by this method, especially in respect of œstradiol-17β.

Results in the five normal males are also given in table II. In only one (case 1) was any œstrogen measurable.

Discussion

As the accompanying figure shows, the separation technique elaborated for urine (Aitken and Preedy 1956) is quite satisfactory when applied to the plasma of late pregnancy. The three œstrogens are not only widely separated from one another, but also from the relatively large peaks of fluorescent interfering material. It is clear from this figure that, unless good separation is obtained, estimates of the amount of œstrogen present must be inaccurate.

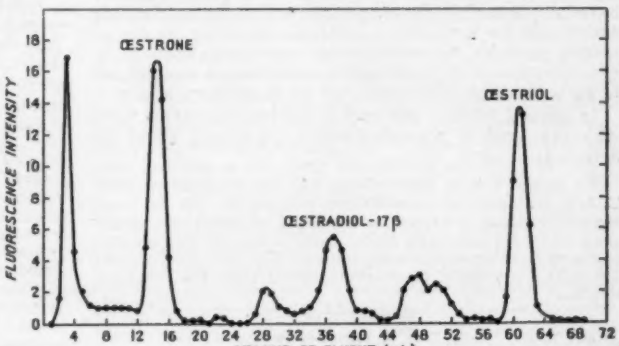
As part of an investigation into placental œstrogens, Dicsfalusy (1953) determined the œstrogen content of whole blood obtained from six pregnant women at parturition. A fluorimetric technique similar to our own was used, but preliminary separation by 24-stage counter-current distribution, although adequate for pure œstrogen solutions, failed to give good separation of œstrogens from the interfering material in blood, especially in the first stages.

TABLE II—PLASMA-ŒSTROGEN LEVELS IN NORMAL MENSTRUATING FEMALES DURING THE LUTEAL PHASE AND IN NORMAL MALES

—	Case no.	Age	Day of menstrual cycle	Œstrogen levels (μg. per 100 ml. plasma)		
				Œstrone	Œstradiol-17β	Œstriol
Females	1	21	25	0·215	<0·070	0·296
	2	20	23	0·134		
	3	22	24	0·145		<0·150
	4	21	25	<0·060		
	5	21	25			
	6	23	24			0·208
Males	1	38	..	0·111	<0·070	<0·150
	2	33	..	<0·060		
	3	35	..			
	4	32	..			
	5	33	..			

Œstrogen levels found in pregnancy plasma lie well within the sensitivity range of the present method. As little as 8 ml. plasma, or even less, is required for one estimation. Serial determinations can therefore be performed in the same case.

We decided to obtain plasma from the menstruating females during the luteal phase of the cycle, since Brown (1955) has shown that the urinary excretion of œstrone, œstradiol-17β, and œstriol is highest during this phase. Plasma-œstrogen levels might then also be at their highest, although there is no evidence that urinary œstrogen levels accurately reflect those in the blood.



A typical chromatogram of pregnancy plasma extract, showing the separation of œstrone, œstradiol-17β, and œstriol obtained by gradient elution partition chromatography. The unlabelled peaks are due to fluorescent interfering material.

In spite of the use of much larger samples, however, only very small amounts of œstrogen could be detected in the plasma of the menstruating females. Œstrone was measurable in three of the six cases only, and œstriol in two of the six cases. No œstradiol-17β could be detected in any case. The measured values can therefore be only approximate. Furthermore, identification of the three œstrogens in these cases depends only on the finding of fluorescent peaks in the expected positions. This is not entirely satisfactory.

In the plasma of pregnancy, on the other hand, the œstrogen peaks in the chromatogram can be identified with reasonable confidence, because of the larger amounts of œstrogen present and the absence of any other immediately adjacent peaks. Furthermore, the addition of pure crystalline œstrone, œstradiol-17β, and œstriol to pregnancy-plasma extracts resulted in a symmetrical increase in size of the three existing œstrogen peaks.

The lowest amounts of œstrogen that can conveniently be detected in plasma by this method, using 18 ml., are: œstrone, 0·06 μg. per 100 ml.; œstradiol-17β, 0·07 μg. per 100 ml.; œstriol, 0·15 μg. per 100 ml.

The state in which œstrogens exist in the blood is uncertain (Lieberman and Teich 1953). The distribution between plasma and cells is unknown, and the extent to which œstrogens are bound to plasma proteins is difficult to determine. Œstrogens may occur in free form, or as glycoronides or sulphates. In order to minimise the difficulties so created, it was decided to use plasma only, and to obtain figures for total œstrogen content by preliminary refluxing of the plasma for 45 minutes in 1·8-N acid. This procedure denatures the plasma protein, and might be expected to release all œstrogen bound to the protein, although this would be difficult to prove. At the same time œstrogen conjugates would be hydrolysed.

It is known that uncombined œstrogens are resistant to refluxing in acid under these conditions (Marrian and Bauld 1951, Katzman et al. 1954), and it therefore appeared unlikely that significant amounts of œstrogen would be destroyed by our procedure. In addition, recoveries of pure crystalline œstrogens added to plasma before hydrolysis, extraction, and chromatography, were within the range of recoveries of œstrogen from urine reported by Aitken and Preedy (1956).

These results may provide a basis for the further study of plasma-œstrogens, especially in normal and abnormal pregnancies. Preliminary observations suggest that the method will also be of value in the study of plasma-œstrogen levels in hepatic disease.

Summary

Plasma levels of œstrone, œstradiol-17β, and œstriol have been determined in pregnancy and in normal females and males by a chemical method, involving gradient-elution partition chromatography and fluorimetry.

In pregnancy, the œstrogen concentrations were found to lie well within the sensitivity range of the method.

In normal females and males, the concentrations were very low, and in several cases, no œstrogen could be detected.

We should like to acknowledge our indebtedness to Prof. C. J. O. R. Morris for constant help and advice. We are most grateful to those colleagues and medical students who kindly gave blood for œstrogen determinations in the normal, and to the staff of the obstetric department, The London Hospital, for their coöperation in obtaining blood from the pregnant women.

REFERENCES

Aitken, E. H., Preedy, J. R. K. (1956) *Biochem. J.* **62**, 15P.
Brown, J. B. (1955) *Lancet*, i, 320.
Dicsfalusy, E. (1953) *Acta endocr., Copenhagen*, suppl. 12.
Katzman, P. A., Straw, R. F., Buehler, H. J., Doisy, E. A. (1954) *Rec. Progr. Hormone Res.* **9**, 45.
Lieberman, S., Teich, S. (1953) *Pharmacol. Rev.* **5**, 285.
Marrian, G. F., Bauld, W. J. (1951) *Acta endocr., Copenhagen*, **7**, 240.

PULLED ELBOW

M. R. SALKIND
M.R.C.S.
GENERAL PRACTITIONER, CLAPTON, LONDON

SUBLUXATION of the head of the radius distally under the annular ligament, or "pulled elbow," is a distinct clinical entity seen in children, which deserves to be better known.

It was first described by Fournier (1671), and later by Lindeman (1885). In the United States Magill and Aitken (1954) give as high an incidence as 3% of all children aged 8 years or less, attending a Boston fracture clinic over a period of two years. In children under 5 years of age it is twice as common as supracondylar fractures of the lower end of the humerus (Plewes 1956). Its frequency in general practice must therefore be far from negligible.

No case has been reported in anyone over the age of 8. This is accounted for by the change in size of the head of the radius relative to the size of its neck. Up to 5 years of age the head is smaller than the neck (Piersol 1930), and can thus slip easily under the retaining band of the annular ligament. The head increases in size relative to the neck until at 8 years it is actually larger and so is retained in position by the annular ligament.

The diagnosis should be simple. The history is usually that the child's extended arm was pulled when he was lifted to a higher position. There is sometimes a snap, and the child is unable or unwilling to use the affected arm. In some cases the child comes to the parent, crying and fretful, with his arm limp, and no history of a pull is obtainable, though there has certainly been one. Often the child cannot refer complaints to any particular site, but at times he complains of pain in the shoulder, clavicle, or wrist. This accounts for the multiplicity of diagnoses which have been made. Now that poliomyelitis is more common, sudden limpness of an arm is an important symptom.

Physical signs are few—namely, limitation of supination, and occasional tenderness over the head of the radius. Presence of a rubbery resistance to passive supination and extension beyond 160° has been described (Magill and Aitken 1954). Radiographs are always normal.

Reduction is immediately effective and can dramatically relieve the symptoms. The doctor's thumb is placed just behind the radial head and the child's forearm is supinated and extended. Sudden supination has also been recommended (Plewes 1956). In most cases, the child can at once move the arm; crying and fretting cease forthwith.

Where the diagnosis is not made, a sprain is usually suspected. The unfortunate child then wends his way from doctor to clinic and back again until such time as the manœuvre is carried out, often accidentally in the course of a physical examination, or even whilst radiographs are being taken. Recurrence is common—perhaps the initial dislocation in some way leads to this.

Case-reports

Case 1.—This girl had three subluxations.

First.—At 10 months. She was crawling along a balcony when her father, in alarm, pulled her back by the arm. It became limp, and she was taken to the nearest doctor. The dislocation reduced itself during the examination.

Second.—At 2 years. She was pulled upright from a sitting position. She cried out, and her arm became limp. Her shoulder seemed tender, but was not dislocated. Radiography showed nothing abnormal and the mother was told that nothing was wrong and that the trouble would right itself. She was seen that evening in surgery and was asked to attend next morning if no improvement had taken place. She did so, and was sent to the local children's hospital. There the correct diagnosis was made and treatment gave immediate relief.

Third.—At 3 years. She came running into the house crying with the same arm limp. She was taken to the surgery and treated by extension and supination. She left holding her toys in her arms. No history of pull was obtainable on this occasion.

Case 2.—A girl who suffered two subluxations.

First—At 5 months. She was sitting on her father's knee and fell backwards. Her left arm was caught as she fell; it became limp and she was very fretful. She was visiting relatives at the time, and was taken to the nearest teaching hospital. The casualty officer was unable to make a diagnosis, but the elbow clicked back into position while radiographs were being taken.

Second.—At 10 months. There was an exact repetition of the first episode. When she was brought to the surgery she had limitation of supination and tenderness over the head of the radius. Extension and supination resulted in immediate freeing of the elbow-joint.

Summary

In young children the head of the radius is smaller than the neck, and subluxation under the annular ligament is not rare. After a pull, the arm becomes limp. Reduction, by supination and extension with a thumb behind the radial head, gives immediate relief.

REFERENCES

Fournier, D. (1671) L'œconomie chirurgicale. Paris.
Lindeman, S. H. (1885) *Brit. med. J.* ii, 1058.
Magill, H. K., Aitken, A. P. (1954) *Surg. Gynec. Obstet.* **98**, 751.
Piersol, G. A. (1930) Human Anatomy. Philadelphia.
Plewes, L. W. (1956) *Brit. med. J.* i, 1227.

AFFERENT-LOOP STRANGULATION FOLLOWING PARTIAL GASTRECTOMY

A CASE-REPORT

F. C. HOYTE
M.B. Lond., F.R.C.S.
LATE SURGICAL REGISTRAR

W. H. W. JAYNE
M.B. Lond., F.R.C.S.
SENIOR SURGICAL REGISTRAR

W. K. PALLISTER
M.B. Lond., F.F.A. R.C.S.
LATE ANÆSTHETIC REGISTRAR

WESTMINSTER HOSPITAL, LONDON

A DESCRIPTION of 15 collected cases of small-gut strangulation following partial gastrectomy has been given by Stammers (1954) and a further case is reported here. It is unusual because it followed a short-loop antecolic anastomosis and was accompanied by a volvulus of the stomach. Record is also made of the successful use of intra-arterial transfusion in the resuscitation of the patient who was suffering from advanced non-hæmorrhagic shock (Horton et al. 1953).

Case-report

A man aged 47 came to the orthopædic outpatient department with pain in the back for two months. He was found to have had melæna for five days and his hæmoglobin level was estimated to be 33% of normal. Conservative treatment, including blood-transfusion, was begun, but after three days the pain grew worse and he vomited more than a pint of blood. Immediate laparotomy was advised and although he had not complained of dyspepsia a giant benign ulcer was found on the lesser curve of the stomach for which partial gastrectomy was performed. An ante-colic Polya type of anastomosis was made with the afferent loop attached to the lesser curve, and care was taken to ensure that the jejunal loop used was short.

Postoperatively the abdominal wound ruptured and was resutured but, despite this setback, he made a good recovery and was discharged to a convalescence home.

There, on the 23rd day after the gastrectomy, he had severe pain in the back and left side of the abdomen: it came on suddenly, and gradually grew worse; it was colicky and radiated to the left testis. He vomited three times without relief. Thirty hours later he was readmitted to hospital and signs of generalised peritoneal irritation, greatest on the left side, were noted. His general condition was poor and it was apparent that he was suffering from advanced peripheral circulatory failure; the pulse-rate was 110 per minute and the blood-pressure 75/55 mm. Hg (his normal was 120/80). It seemed that he had had a perforation of the gastro-intestinal tract or possibly a delayed hæmorrhage from the spleen damaged during the gastrectomy. Immediate operation was advised and, because of the possibility of hæmorrhage, he was taken to the theatre where resuscitation began. Intravenous saline was used until compatible blood could be obtained. His condition rapidly deteriorated and the systolic blood-pressure fell to 30 mm. Hg, the respirations were gasping, and he appeared to be about to die. When blood was available intra-arterial transfusion was performed using the right radial artery, and two pints were given in seven minutes followed by a third more slowly. There was an immediate improvement in his condition and respiration became more normal; at the end of twenty minutes the systolic pressure had risen to 75 mm. and, as he was now better able to withstand operation, anæsthesia was induced.

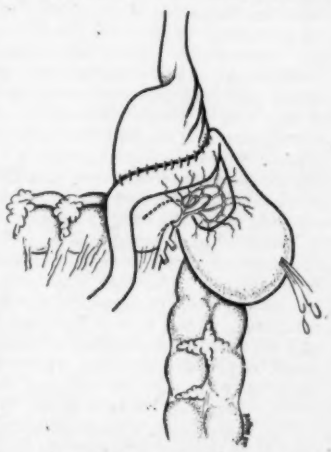


Diagram of operation findings.

When the abdomen was opened through a left upper paramedian incision a loop of small gut was found in the left paracolic gutter. It was distended to a diameter of 3 in. and was discoloured green-brown with a gangrenous patch in the centre of which was a perforation. Intestinal contents poured through the hole (see figure). Further search eventually showed that the stomach had undergone a volvulus through 180° about its long axis so that its posterior wall now faced anteriorly; the direction of the twist was such that the greater curve and efferent loop had passed in front and to the right, while the lesser curve and afferent loop had passed behind and to the left. The distended gut first seen proved to be the afferent loop strangulated by the gap between the anastomotic jejunal loop and the transverse mesocolon, and it was hanging over the first jejunal branches of the superior mesenteric artery down into the left paracolic gutter. The afferent and efferent loops were therefore replaced in their normal positions and the volvulus of the stomach untwisted. The perforation, which was not far from the duodenojejunal flexure, was closed and the gangrenous patch buried. In order to prevent a recurrence the loops were fixed to the parietal peritoneum with a few interrupted catgut sutures. During the operation further intra-arterial blood was given, half a pint at a time, as indicated by the blood-pressure; a total of four and a half pints was given and at the end of the operation the blood-pressure had stabilised at 110/75 and a slow intravenous transfusion was now running. He made a good recovery and when last seen in the outpatient department was well.

Discussion

Strangulation of the small bowel as a complication of partial gastrectomy has been reported several times and may involve either the afferent or efferent loop. We found in the literature 10 cases involving the afferent loop of an antecolic anastomosis, but in each one mention was made that a long loop was used, and in none of these cases was volvulus of the stomach noted. (Quinn and Gifford 1950, West 1953, Stammers 1954.)

It seems reasonable that the use of a short loop should avoid the complication of strangulation and has been advocated for that purpose. That it does usually avoid it

is probably borne out by the fact that, so far as we know, this is the first case recorded in which a short loop was used and it is hard to explain the mechanism of its occurrence. It may be that this loop used was too short and formed a straight line with the œsophagus and lesser curve. This could have acted as a firm pivot or bowstring about which the adjacent and more mobile portions of the gastro-intestinal tract were able to rotate.

In the early stages of shock intravenous transfusion increases the venous return to the heart, which responds with an improved output, and the distribution of the blood-volume begins to return to normal. But in the later, or "irreversible," stage the cardiac output and blood-pressure are so low that the coronary circulation is inadequate and progressive myocardial depression ensues; it is this that prevents the usual response to intravenous transfusion and explains its failure to improve a shocked patient under these conditions. At the same time there is anoxic damage to the liver, and this has been implicated in the development of shock; this damage, however, is reversed when the oxygen supply to the liver is improved.

Because the arterial tree is a relatively closed system the pressure within it will be directly raised by pumping blood into it; in this way not only is the effective circulating blood-volume rapidly restored but the blood-pressure is raised so that increased coronary flow results and myocardial depression is reversed. The progress of shock is arrested and the whole of the circulation now tends to return to normal and the oxygenation of the brain, liver, and kidneys is improved.

The indications for intra-arterial transfusion in this case were the low blood-pressure and slowing pulse-rate which suggested clinically that myocardial depression had set in (Wiggers 1949). We believe that the sequence of events following intra-arterial transfusion in this patient was, in essence, as we have described, and that this accounts for the recovery of a man who had had an intraperitoneal perforation for more than thirty hours and had to undergo a major operation.

Our thanks are due to Mr. F. d'Abreu for permission to publish this report and to Dr. R. Wise who gave the anæsthetic on each occasion.

REFERENCES

Horton, J. A. G., Inkster, J. S., Mackenzie, A., Pask, E. A. (1953) *Brit. med. J.* ii, 1294.
Quinn, W. F., Gifford, J. H. (1950) *Calif. Med.* **72**, 18.
Stammers, F. A. R. (1954) *Brit. J. Surg.* **42**, 34.
West, J. P. (1953) *Surgery*, **34**, 98.
Wiggers, C. J. (1949) Physiology in Health and Disease. London; p. 813.

MANAGEMENT OF RESPIRATORY INSUFFICIENCY AFTER POLIOMYELITIS

AN ILLUSTRATIVE CASE

N. JOELS
B.Sc., M.B. Lond.
RESEARCH ASSISTANT, RESPIRATORY PARALYSIS UNIT

L. J. HURWITZ
B.Sc., M.D. Belf., M.R.C.P.E.
HOUSE-PHYSICIAN

F. E. DREIFUSS
M.B. N.Z., M.R.C.P.
HOUSE-PHYSICIAN

THE NATIONAL HOSPITAL, QUEEN SQUARE, LONDON

AFTER the acute stage of poliomyelitis ventilatory capacity may be greatly reduced yet allow the patient to return home without artificial respiratory aid. Such a patient is vulnerable to even a small further reduction of his respiratory reserve, which may lead to his admission to hospital as a respiratory emergency. The following case illustrates the insidious onset of respiratory insufficiency 9 years after the attack of poliomyelitis, and is remarkable for the ease with which short periods of artificial respiration could profoundly disturb acid-base balance.

Case-report

A man aged 30 had had an attack of acute poliomyelitis 9 years before. The respiratory muscles and limbs were extensively involved. He was treated in a cabinet respirator for 14 months, and on discharge from hospital, 2 years after the onset, his vital capacity was about 1250 c.cm. At home he led mainly a bedridden existence, though he could walk a few steps. His respirations seemed adequate until the beginning of June, 1956, when his breathing became noticeably shallower. There was nothing to point to any specific illness though he was listless and unusually dry and thirsty.

First Emergency

During the night of June 13, he lapsed into stupor and muttering delirium and next day he was admitted to another hospital where he was intubated and put into a cabinet respirator. Despite this he became comatose. He was then transferred to the National Hospital, Queen Square, on a Beaver positive-pressure respirator. His condition gradually improved and within 3 hours, though still drowsy, he could be roused sufficiently to answer questions. The same evening, however, he again became comatose. He was then being ventilated at 10 litres a minute. Blood-pressure was 85/50 mm. Hg; pulse was regular at 100 a minute; blood-sugar, blood-urea, and serum-potassium levels were normal.

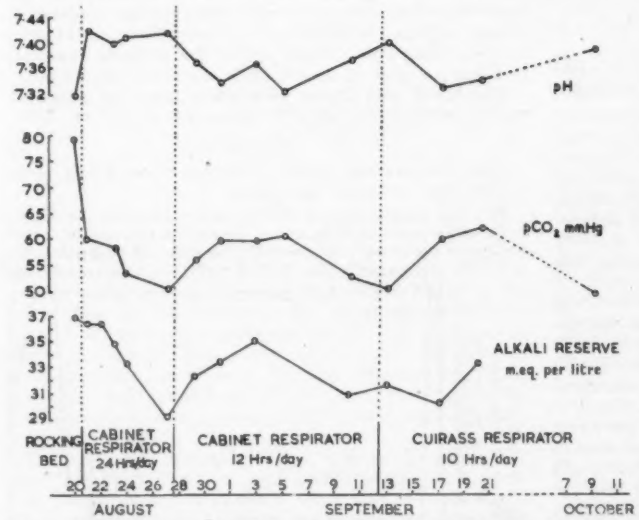
3 hours after the onset of this further relapse spontaneous muscle fasciculations were noticed in the upper limbs and a strongly positive Chvostek sign could be elicited. These signs indicated that the patient had passed into a state of hypocapnic coma. This conclusion was justified by an immediate and dramatic improvement in the conscious level when 3 litres a minute of a mixture of 5% CO_2 and 95% O_2 were added to the inspired air. The muscle fasciculations ceased and the Chvostek sign disappeared after a few minutes. The blood-pressure rose slightly to 100/60 and the pulse-rate remained constant.

At midday on June 15, when he was being ventilated at 9 litres a minute including $1^1/_2$ litres of 5% CO_2 and 95% O_2, arterial puncture was performed. The arterial O_2 saturation was 95%, the pH 7·57, and the pCO_2 (calculated by the Henderson-Hasselbalch equation from the pH and plasma CO_2) was 30 mm. Hg. The alkali reserve was 30·2 m.eq. per litre. This combination of a raised alkali reserve and lowered arterial pCO_2 indicated that respiratory and metabolic alkalosis were simultaneously present. The metabolic alkalosis represented an attempted compensation for the previous respiratory acidosis resulting from his long-standing chronic underventilation. The respiratory alkalosis was due to the washing out of CO_2 by the artificial ventilation, and was still considerable even after several hours during which 5% CO_2 had been added to the inspired air. There must have been, therefore, an even greater alkalosis when he was clinically in alkalotic coma.

The patient was transferred to a cabinet respirator and the endotracheal tube removed. His condition continued to improve so that by the 5th day weaning from the respirator could be begun. On the 7th day, when his vital capacity had risen to 800 c.cm., he was breathing unaided for an hour morning and afternoon. At the end of one of these hour-long periods the arterial O_2 saturation was 92%, with pH 7·36, pCO_2 51 mm. Hg, and alkali-reserve 31·7 m.eq. per litre. Despite the mild degree of hypoventilation indicated by these results, his clinical condition appeared to justify his being left out of the respirator for increasing lengths of time, and on July 2 he was discharged.

Second Emergency

On July 12 he was readmitted. He had been well until that morning, when he awoke feeling listless, apathetic, and anorexic. On admission he was rational but drowsy and cyanosed. His respirations were shallow and the vital capacity was only 450 c.cm. The arterial O_2 saturation was 70%, the pH 7·37, the pCO_2 69 mm. Hg, and the alkali-reserve 35 m.eq. per litre. He was put in a cabinet respirator at 7.30 P.M. and his cyanosis rapidly improved. An hour later he became unresponsive, but when the rate of the machine was reduced from 20 to 16 cycles a minute he awoke and talked normally within 30 seconds. At 9.15 P.M. he again became unresponsive



Effects of different forms of artificial respiration on pH, pCO_2, and alkali-reserve. Determinations made on arterial or arterialised-venous blood.

and exhibited a marked bilateral Chvostek sign. The pupils were constricted and did not respond to light, the corneal reflexes were absent, and there was marked muscle fasciculation. He was flushed and pink. The rate was reduced to 13 a minute, and within 20 seconds the pupils dilated widely and reacted to light through a small range. Within 50 seconds he became sufficiently conscious to answer simple questions and the Chvostek sign disappeared. During this episode the blood-pressure ranged between 105/70 and 110/90 and the pulse between 96 and 126 a minute. The loss of consciousness was therefore not due to circulatory collapse but to a lowering of the CO_2 tension in the blood by the artificial ventilation. Subsequent progress was satisfactory apart from a collapse of the left lower lobe, which re-expanded following bronchoscopic suction.

Preventive Measures

These repeated episodes of respiratory insufficiency clearly showed that this patient would continue to need some form of assistance to maintain adequate ventilation. An attempt was made over the next 4 weeks to wean him from the cabinet respirator to a rocking bed, since this would present few problems for home management and would be free from the danger of hyperventilation. Unfortunately, despite rocking for at least 12 hours each day, he gradually became so dyspnœic and lethargic that the rocking bed at this stage hindered rather than helped his breathing, since he was unable to synchronise his respirations with its movements. We therefore conducted a more detailed study of the blood-gas and acid-base changes to decide on the most suitable form of respiratory aid.

These findings are illustrated in the figure. At the end of the period on the rocking bed the pCO_2 was 79 mm. Hg, the blood pH 7·32, and the alkali reserve 37 m.eq. per litre. The patient was again placed in the cabinet respirator and ventilated at 7–8 litres a minute. Within 24 hours the pCO_2 had fallen to 60 mm. Hg and the pH had risen to 7·42. At the end of a week, during which the pH remained at about 7·4, the pCO_2 had fallen steadily to 50 mm. Hg. The period in the respirator was then reduced to 12 hours each day, and though at first the alkali reserve and pCO_2 rose slightly, after about a week they again began to fall and the pH to rise.

Since CO_2 was thus not retained when the cabinet respirator was used for 12 hours a day, we decided to replace it with a cuirass respirator, and the figure shows that, after a similar initial few days for acclimatisation, 10 hours each night in the cuirass was sufficient to maintain ventilatory equilibrium. After 4 weeks of using the cuirass, the vital capacity was 800 c.cm., the arterial oxygen saturation 91%, the pH 7·40, and the pCO_2 50 mm. Hg.

The patient was accordingly discharged home with his cuirass and has continued to make satisfactory progress.

Discussion

In patients with a grossly reduced vital capacity, a minor respiratory infection is known to be the commonest cause of respiratory failure; but it is not so widely realised that such a failure can take place without any obvious precipitating cause. Ferris et al. (1952) have demonstrated decreased compliance in convalescent poliomyelitis patients. This may be due to emphysematous changes in the lungs, produced by the artificial respiration, or to increase in the rigidity of the chest wall itself because its expansion is small. Such changes probably progress for several years after the original illness, the final stages of respiratory failure being precipitated by the increasing anoxia and rising CO_2 tension resulting from the impaired ventilation. Closer questioning of our patient's family revealed that there had been progressive reduction in his ventilation for the past 2 years, culminating in the respiratory failure of June, 1956.

The high alkali-reserve indicates a measure of compensation for such prolonged respiratory insufficiency. This metabolic alkalosis was responsible for the extraordinary rapid swing from hypercapnic to hypocapnic coma when effective artificial respiration was begun. We have never seen such a change in cases of acute respiratory failure, in which the onset is presumably too acute for any considerable compensatory metabolic alkalosis to arise. This seems to be borne out by Astrup et al (1954) who, in a case of acute poliomyelitis, reduced the pCO_2 from 150 to 14 mm. Hg without untoward effects.

Even more startling than the ease with which our patient swung from hypercapnic to hypocapnic coma was his recovery of consciousness within a minute of reducing the rate of the cabinet respirator. The rapidity of this recovery was puzzling since the reduction in ventilation could not have appreciably altered the arterial blood-gas tensions in such a short period.

Although in this patient the fasciculation and the positive Chvostek sign helped to distinguish between hypocapnic and hypercapnic coma, these signs may be absent in hypocapnia, and Westlake et al. (1955) have described similar muscular irritability in hypercapnia following oxygen therapy in emphysema. Determination of the arterial pCO_2 is therefore a most valuable guide to the ventilatory state in these circumstances. Its value was further emphasised during the assessment of the most suitable type of respiratory aid for this patient.

Summary

A case of acute respiratory failure, 9 years after an attack of poliomyelitis, is described.

This patient showed an unusually rapid swing from hypercapnic to hypocapnic coma with only moderate artificial respiration.

The value of blood-gas analysis in assessing such disturbances of acid-base equilibrium and in selecting the most suitable type of respiratory assistance is illustrated.

We are grateful to the medical committee of the National Hospital, Queen Square, and to Dr. Michael Kremer, under whose care the patient was, for permission to publish this case; and to Dr. Kremer and Dr. R. Atwood Beaver for their advice.

REFERENCES

Astrup, P., Gøtche, H., Neukirch, F. (1954) *Brit. med. J.* **i**, 780.
Ferris, B. G. jun., Mead, J., Whittenberger, J. L., Saxton, G. A. jun. (1952) *New Engl. J. Med.* **247**, 390.
Westlake, E. K., Simpson, T., Kaye, M. (1955) *Quart. J. Med.* **24**, 155.

Preliminary Communication

REAGIN CONTENT OF CHROMATOGRAPHIC FRACTIONS OF HUMAN GAMMA-GLOBULIN

SEVERAL attempts have been made to decide which of the electrophoretic fractions of human serum-proteins contain the skin-sensitising antibodies—the reagins. Electrophoresis convection [1–3] suggested that reagins may be present in any or all of the globulin fractions. However, zone electrophoresis on starch [4] and continuous electrophoresis [5] showed definite localisation of reagin activity in the γ-globulin and particularly in the faster-moving γ^1-globulin fraction.

We observed that slight modification of the Peterson and Sober [6] technique of chromatography of serum-proteins on diethyl amino ethyl cellulose gave, with human serum, one main γ-globulin fraction together with several smaller fractions of γ-globulin. When examined by paper electrophoresis, the main fraction was found to move distinctly more slowly at pH 8·6 than the small fractions (which were indistinguishable from each other). It appeared that a simple fractionation of the slower and faster moving γ-globulin had been obtained and that the γ^1-globulin was further subdivided into several reproducible fractions. In view of the previous evidence that reagins are largely in the γ^1 fractions, it was decided to fractionate sera from allergic subjects and to test whether the reagins were localised in one or more fractions. It was found that with sera from six people allergic to a variety of substances, reagin activity was always highest in one γ^1 fraction, and in most cases was almost confined to that fraction.

EXPERIMENTAL

Chromatography

Diethyl amino ethyl cellulose was prepared as described by Peterson and Sober.[6]

The buffers used for development were 0·01 M sodium phosphate pH 7·5, 0·02 M sodium phosphate pH 6·2, and 0·05 M NaH_2PO_4. All were saturated with toluene before use. Gradient elution was not used. Each buffer was run through until no further protein was eluted, and the next buffer was then added. The column was equilibrated with the weakest buffer at 2°C and the serum sample dialysed against this buffer before running on the column at 2°C. 3 ml. serum were fractionated on a 3 g. column (1·1 × 12 cm.) with a rate of flow of about 5 ml. per hour. Estimation of protein concentration in the eluate was by measurement of the absorption at 280 mμ in 1 cm. cell in a spectrophotometer.

Assay of Reagins

The chromatographic fractions were concentrated by pressure dialysis against 0·14 M NaCl and the volume of each adjusted to equal the volume of serum put on the column (3 ml.). The fractions were sterilised by filtration through 'Oxoid' membrane filters (Oxo Ltd., London, E.C.4).

Assay was by the Prausnitz-Küstner [7] passive sensitisation test.

0·1 ml. of three dilutions of the serum fractions were injected intracutaneously into the skin of the forearm, thigh, or back, of volunteers who, by previous tests, had been shown to be insensitive to the antigen used. The sites of injection were marked, and 48 hours later were challenged by pricking through drops of antigen solution. A positive reaction consisted in the appearance of a weal and erythema which was maximal in about 15 minutes and disappeared in 1–2 hours. The area of the weal at its maximum was estimated by measuring the diameter in two directions at right-angles.

Serum was obtained from members of the staff of this institute who had a history of hay-fever and/or asthma and who were shown by skin tests to be sensitive to mixed pollens ('Pollaccine'), horse-serum, or extracts of cat or dog scurf. Only one of the subjects examined had had a course of desensitising injections of antigen.

The blood was drawn aseptically from the arm, and was allowed to clot, and the serum was stored at −10°C.

RESULTS

Fig. 1 shows the elution diagram when 3 ml. serum (J. M.) was run on a 3 g. column.

The fast peak has come through the column at the solvent front without adsorption and is certainly a mixture of several components; peak 2 is adsorbed and retarded to some extent in 0·01 M phosphate buffer. 0·02 M buffer was then run through

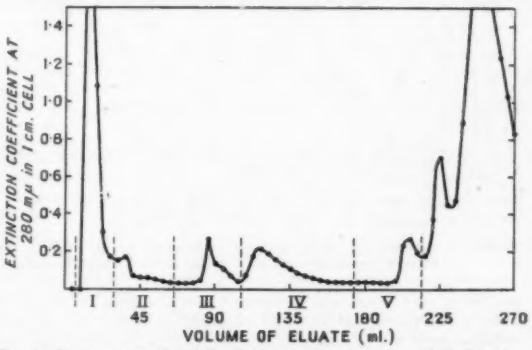


Fig. 1—Chromatography of 3 ml. human serum on 3 g. diethyl amino ethyl cellulose. (Column 1·1 × 1·1 cm.)

0–45 ml. eluting with 0·01 M sodium phosphate pH 7·5.
45–180 ml. eluting with 0·02 M sodium phosphate pH 6·2.
180–270 ml. eluting with 0·05 M sodium dihydrogen phosphate.

and two more peaks emerged, the shape of the first suggesting that it might contain two partially resolved components. Finally with 0·05 M buffer a large complex peak appeared. Peaks 1, 2, 3, and 4, when tested by paper electrophoresis at pH 8·6, proved to be all γ-globulin.

In fig. 2 the results with peaks 1 and 3 are shown.

Electroendosmosis has moved both fractions towards the cathode, but it is clear that there is a distinct difference in their mobility. Fractions 2, 3, and 4 were indistinguishable by paper electrophoresis. Fraction 5 contained material moving between the γ and β bands, and later fractions were complex but contained no γ-globulin.

Of eight sera examined, all showed similar patterns with the same components present. Some quantitative differences were seen in the relative proportions of each

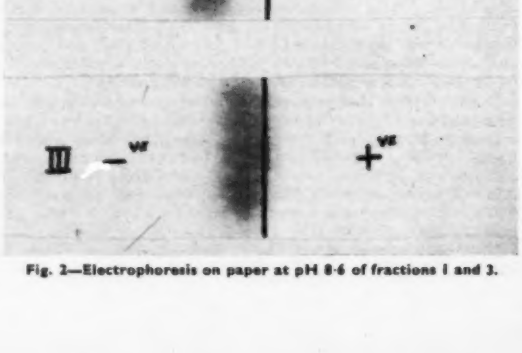


Fig. 2—Electrophoresis on paper at pH 8·6 of fractions I and 3.

1. Campbell, D. H., Cann, J. R., Friedman, T. B., Brown, R. *J. Allergy*, 1950, **21**, 520.
2. Loveless, M. H., Cann, J. R. *Science*, 1953, **117**, 105.
3. Campbell, D. H., Cann, J. R., Friedman, T. B., Brown, R. *Ibid*, 1954, **119**, 289.
4. Kuhns, W. J. *J. exp. Med.* 1954, **99**, 577.
5. Brattsen, I., Colldahl, H., Laurell, A. H. F. *Acta Allerg.* 1955, **8**, 1.
6. Peterson, E. A., Sober, H. A. *J. Amer. chem. Soc.* 1956, **78**, 751.
7. Prausnitz, C., Küstner, H. *Zentralbl. Bakt.* 1921, **80**, 160.

TABLE I—REAGIN ACTIVITY OF γ-GLOBULIN FRACTIONS
(Weal area, in sq. mm., with J. M. serum)

Concentration	Fraction					Whole serum
	1	2	3	4	Euglobulin	
1/1	0	70	100	60	0	90
1/10	0	10	60	trace	0	80
1/100	0	0	trace	0	0	50

fraction, but no attempt was made to evaluate these variations.

Each fraction was concentrated to the volume of the serum used and then assayed for reagin activity. This method of comparison gave the relative total amount of reagin in each fraction, but it did not give the activity per milligramme of protein; for the weight of protein in fraction 1 was about two-thirds of the total γ-globulin, and hence there was a much higher protein concentration in the test solution.

The results of the reagin test with J. M. serum are given in table I. The most striking feature is that fraction 1 is devoid of activity, some is present in fractions 2 and 4, but fraction 3 was by far the most active. No activity was detected in the other fractions, nor was any

TABLE II—REAGIN ACTIVITY OF γ-GLOBULIN FRACTIONS
(Weal area, in sq. mm., with D. A. serum)

Concentration	Fraction					Whole serum
	1	2	3	4	5	
1/5	40	36	90	80	40	130
1/25	20	0	40	10	0	60
1/125	0	0	10	0	0	10

present in the small euglobulin precipitate which formed when the serum was dialysed against 0·01 M buffer before chromatography. With four other sera very similar results were obtained, and in some cases activity was found only in fraction 3.

The sixth serum (D. A.), from a person who was very sensitive to horse-serum, gave a somewhat different result. The reagin content appeared to be much higher, and the results obtained with the different fractions are shown in table II. Activity is more widely distributed and some is present in fraction 1. Fraction 3 has most of the activity and, if judged by activity per milligramme of protein, is much the highest, fraction 1 being clearly the lowest. It is possible that the relative distribution of activity here is similar to that in the other sera; but, as the total content is higher, it has now become more apparent in the least active fractions.

Serum D. A. was tested for precipitins against horse-serum by the ring test and by diffusion in agar, but none were detectable.

DISCUSSION

This work has confirmed the observations of Kuhns [4] and Brattsen et al.[5] that reagins against several antigens are found chiefly in the γ^1 globulins. It has further shown that the reagins are principally in one fraction of the γ^1-globulins; and this technique would appear to offer a simple method of purifying reagins. The significance of restriction of the reagin activity to only about 10% of the total γ-globulin fraction is not clear. When sera from two "normal" people were chromatographed, there was no apparent difference in the elution pattern. Neither of these subjects had ever had any known allergic symptoms and they gave negative skin tests to the antigens tested. It seems, therefore, that fraction 3 is a normal constituent and that only a small part of it is reagin.

No human serum with a satisfactory content of precipitins could be obtained; but, when a rabbit anti-bovine serum-albumin serum was fractionated by the same technique, there were found to be three principal γ-globulin components and the proportion of antibody in each was the same (within the error of the method). This serum was taken from a hyperimmune rabbit (16 mg. precipitating antibody per ml. serum) and it is uncertain whether this result has much significance in relation to the results to be expected with a human serum containing precipitin. It may perhaps be taken to suggest that human precipitin will be present in most fractions and not sharply localised as are the reagins. Using the purified reagins of fraction 3, we were able to confirm that, unlike that of precipitins, their activity was destroyed by heating at 56°C for 4 hours as has been reported using whole serum.[8] Attempts were made to test for inhibiting or potentiating factors in the other serum fractions by comparing the weal size produced by fraction 3 alone, and by fraction 3 mixed with other fractions; but no evidence of any such effect was observed.

One possible explanation of these results is that suggested to explain the complexity of rabbit γ-globulin.[9] Different types of cells, perhaps localised in certain tissues produced distinct kinds of γ-globulin. Perhaps only a small number are capable of producing reagins; or perhaps the route of entry of the antigen is such that only a small number receive the stimulus. Test of this suggestion could perhaps best be made by finding whether certain tissues were able to synthesise only some of the γ-globulin fractions.

SUMMARY

When human serum is fractionated by chromatography on diethyl amino ethyl cellulose, the γ-globulin can be resolved into four components. The reagin content of serum from allergic subjects is almost confined to one of these components, which contains about 10% of the total γ-globulin.

We are grateful to the members of the institute staff who gave blood or allowed us to test fractions in their skin. The test antigens were kindly given by Dr. John Freeman, Inoculation Department, St. Mary's Hospital, London, and by Major Milner of Bencard Ltd.

We wish to thank Miss J. Morgan for her excellent technical assistance.

J. H. HUMPHREY
M.D. Camb.
R. R. PORTER
Ph.D. Camb.

National Institute for
Medical Research, London, N.W.7

Medical Societies

ROYAL SOCIETY OF MEDICINE

The Nephrotic Syndrome

ADDRESSING the section of pædiatrics of the Royal Society of Medicine on Jan. 18, Prof. C. A. JANEWAY, professor of pædiatrics at Harvard University, dealt chiefly with his clinic's experience of the nephrotic syndrome in children, in whom it was less variable in its ætiology than it was in adults. Before the introduction of antibiotics, they had thought that there were two separate conditions, "pure lipoid nephrosis" and "chronic glomerulonephritis with œdema." The lipoid nephrosis most commonly began at the age of 2 or 3 years, and 83% of deaths were due to infection, pneumococcal septicæmia being the most frequent. Chronic glomerulonephritis with œdema showed a similar age-incidence, but only 27% of deaths were due to intercurrent infection; renal failure was responsible for 63%. The introduction of antibiotics had completely altered the natural history of the disease. Death from infection was now uncommon

8. Pappenheimer, A. M. *J. Immunol.* 1955, **75**, 259.
9. Askonas, B. A., Humphrey, J. H., Porter, R. R. *Biochem. J.* 1956, **63**, 412.

in most hospitals and clinics. Early treatment of infection was very important. With the knowledge and consent of the family doctor, the parents of nephrotic children were given tetracycline drugs and instructed to begin treatment at the first evidence of infection, and to give prophylactic therapy at half dosage if a respiratory infection appeared in other members of the family. Antibiotics had greatly prolonged life but had had little, if any, effect on final recovery. About two-thirds of all nephrotic children still died of the disease, but now renal failure was by far the most common cause of death. The classical "large white kidney" of the nephrotic syndrome was now a pathological rarity. Such kidneys were previously found in children dying early in the disease from pneumococcal infection, but now the kidney at death showed periglomerular scarring with obliteration of nephrons.

Professor Janeway and his associates now thought that almost all examples of the nephrotic syndrome in children were due to a membranous type of glomerulonephritis, and it was impossible to predict the eventual outcome early in the disease. Modern clearance techniques had given valuable information about the disordered physiology of the condition. During the first month the glomerular filtration-rate was invariably low but the renal plasma-flow was often normal, and therefore the filtration fraction was reduced. Thereafter, during the early reversible phase of the disease, clearances were variable and the glomerular filtration-rate sometimes increased above the normal levels, but it often remained low. During this stage full recovery was possible even in cases complicated by azotæmia, hypertension, or hæmaturia. In the later irreversible phase the low glomerular filtration-rate became progressively reduced until death resulted from uræmia.

The work of Professor Janeway's colleague, Dr. Gitlin, had shown no evidence of abnormality in the chemical composition of plasma-protein in the nephrotic syndrome. Albumin from plasma, urine, œdema fluid, and ascitic fluid was identical with normal plasma-albumin when tested by delicate immuno-chemical methods. The albumin deficiency was partially attributable to increased urinary loss but also to increased metabolic breakdown. In contrast, β-lipoprotein, consisting of macromolecules containing 90% lipid, did not pass through the glomerulus and was metabolised at a diminished rate. This globulin therefore accumulated in the plasma and accounted for the lipæmia of the nephrotic syndrome. Changes in electrolyte metabolism, demonstrated by Metcoff, and consisting of abnormal sodium retention and urinary potassium loss, were thought to be secondary to increased production of aldosterone by the adrenal cortex, which had been detected in the urine by Luetscher. This was probably a physiological response to reduction of blood-volume due to lowered colloid osmotic pressure in the plasma. Increase of circulating blood-volume by salt retention, however, inevitably increased the extracellular fluid volume and thus caused œdema.

Diet could not be so strict in the management of the nephrotic syndrome in children as it was in adults. Children did not tolerate rigid salt deprivation, and often refused high-protein diets. Cortisone and corticotrophin (A.C.T.H.) usually caused a satisfactory diuresis unless the patient was in the later irreversible phase of the disease. There was inadequate evidence to determine whether the natural history of the nephrotic syndrome was modified by hormone therapy. It had still not been finally decided whether treatment with hormones should be intermittent or continuous, but Professor Janeway thought that the balance of evidence was probably in favour of continued treatment until proteinuria had completely disappeared or had become very slight.

Little progress had been made in elucidating the cause of the nephrotic syndrome. The disease produced in rats by injection of anti-rat-kidney rabbit serum, as shown by Heymann, was very similar to the condition in man. All cases of the nephrotic syndrome, as well as disseminated lupus erythematosus and acute glomerular nephritis, were associated with reduction of serum complement. These facts suggested, but did not prove, that the condition might be due to an immuno-chemical factor which was as yet completely undefined.

Reviews of Books

Diagnosis and Treatment of Peripheral Vascular Disorders

DAVID I. ABRAMSON, M.D., F.A.C.P., professor and head of the department of physical medicine and rehabilitation, and professor of medicine, University of Illinois, College of Medicine. London: Cassell. 1956. Pp. 537. 5 guineas.

THIS book is not designed for the specialist in peripheral vascular disease; but it does offer in a very palatable form basic anatomical and physiological data concerning the peripheral vessels, the signs and symptoms associated with their disease, and some of the problems in differential diagnosis. The text, written by a physician with physiological leanings, is concise, lucid, and well illustrated. In the text medical therapy prevails to the virtual exclusion of surgical measures. Many readers will regret that the scope and indications for surgery are not indicated more fully, as doubtless some physicians find difficulty in selecting patients to refer to a vascular centre. With this reservation the work can be warmly recommended for the general physician or practitioner.

The Complete Cookery Book for Diabetics

IRIS HOLLAND ROGERS. London: H. K. Lewis. 1956. Pp. 110. 5s.

THIS little book will be an eye-opener to many diabetics and those that cook for them, for there is enough variety in the numerous recipes given to destroy the monotony of the unnecessarily rigid diets followed by many diabetics.

The carbohydrate, protein, and fat content of each dish is given so that it is still possible (invoking, it must be admitted, a modicum of intelligence) to keep the food value of the diet constant. But achievement of this desirable goal is somewhat impeded by a slight defect in the book: a number of 10-g. carbohydrate exchange dishes are described under the heading of savouries but no attention is drawn to their content of fat and protein. There is a good section on invalid meals designed to provide carbohydrate in easily assimilated form during intercurrent illnesses, and a useful table giving the weights and equivalent household measures of common foods. Sorbitol is widely employed, especially for sweets, cakes, and preserves. In some of these it could not be replaced by saccharin, but it has the disadvantage of being too expensive for some diabetics and of having some carbohydrate value, although it is assumed to have none in these recipes. Many diabetics would prefer to use weighed amounts of cane sugar instead, even if they were allowed smaller portions of the foods thus prepared.

Nevertheless this book is undoubtedly valuable.

Clinical Hematology (4th ed. London: Henry Kimpton. 1956. Pp. 1185. £5 12s. 6d.).—The latest edition of Prof. Maxwell M. Wintrobe's work fully maintains its place as the premier hæmatological textbook. Professor Wintrobe takes pains to emphasise that history-taking, clinical examination, and study of the patient are essential; hæmatology cannot be effectively practised in the laboratory alone. The changes in the five years since the last edition have made necessary new chapters on blood-groups, blood-transfusions, and syndromes associated with abnormal hæmoglobins. The chapters on hæmorrhagic diseases, hæmolytic anæmias, and the production and destruction of red blood-cells have been almost entirely rewritten. Extensive revision is evident everywhere, and in the bibliography—a valuable asset—1600 references have been added and 887 deleted. Therapy has been brought fully up to date. This book is a sane appreciation of the present state of hæmatology, and the new edition will be needed by all who practise the specialty.

'Eminently suitable for medicinal purposes'

'In view of these analytical and general evidences, this brandy may be described as particularly suitable for medicinal purposes'

See Lancet, July 22, 1899, p. 219

'The evidence both of analysis and taste indicates that the high standard of purity and quality has been maintained and that the brandy is eminently suitable for medicinal purposes'

See Lancet, May 7, 1932, p. 992

make friends with MARTELL

London Hospital Catgut

A CONTRIBUTION TO SURGICAL HISTORY

FOLLOWING EXTENSIVE RESEARCH in the Ligature Laboratories, a special report was made to the Medical Research Council. In consequence the Ministry of Health brought the preparation of Sterilised Surgical Catgut in England under the Therapeutic Substances Act.

YOU CAN HAVE ABSOLUTE CONFIDENCE IN **LHC**

Sizes 2/0, 0 and 1 are recommended for general surgery, because finer gauges mean less scar tissue and quicker healing.

WHG/L3

Well in the lead . . .

Penicillin-V Lilly is an effective oral penicillin that is stable in the acid form and is not inactivated by gastric secretions. For the first time in oral penicillin therapy, clinical results produced are consistently comparable with treatment by parenteral penicillin.

When the case calls for penicillin, let Penicillin-V Lilly—the penicillin that "passes the acid test"—be your choice.

The average dose is 0.5 Gm. daily—125 mg. four times in 24 hours, increased in severe infections.

Available as

'Pulvules' **125 mg.** (200,000 units), also 250 mg. and 60 mg. (Paediatric)

Suspension 62.5 mg. per 5 cc. For Paediatric use.

and as TABLETS Penicillin-V-Sulpha, Lilly (Penicillin-V with Sulphonamides).

Lilly

PENICILLIN-V LILLY

ELI LILLY AND COMPANY LIMITED, BASINGSTOKE, ENGLAND

Gradual and sustained lowering of blood pressure

SEOMINAL is primarily indicated in mild or moderate degrees of hypertension. It induces a feeling of calmness and tranquillity without drowsiness, and relieves symptoms such as dyspnoea, congestive headache and vertigo. The hypotensive effect of Seominal is gradual, and may not be apparent for some weeks. The initial dosage is usually two tablets daily, later reduced to one or half a tablet daily.

SEOMINAL

Trade Mark

Each tablet of Seominal contains 'Luminal' 10 mg. (approx. gr. 1/6), theobromine 325 mg. (gr. 5), reserpine (alkaloid of rauwolfia) 0.2 mg.

BAYER PRODUCTS LIMITED

KINGSTON-ON-THAMES, SURREY

Export enquiries to: WINTHROP PRODUCTS LIMITED

THE LANCET

LONDON: SATURDAY, JAN. 26, 1957

Nurse and Doctor

NO-ONE who has followed the brisk exchange in our correspondence columns during the past few weeks can doubt that sharp differences have developed between the medical and nursing sides of hospital staffs concerning the recruitment and training of nurses and the proper relation of nurse to doctor. Nor can it be doubted that these differences must be resolved if our hospitals are to go on giving good service.

The Royal College of Nursing plans to rely eventually on assistant nurses to do the bulk of the practical work, and on a group selected at the start (some of whom would take a degree course) to provide leadership.[1] This plan has merits. In the first place, the training of the ordinary nurses would be more realistic than that of the S.R.N. at present. Secondly, these "assistant" nurses would be a relatively stable element, and accordingly students would be relieved of some of the routine work that now may overshadow their training. (The chief medical officer of the Ministry of Health has lately declared: "Too many hospitals still rely on student nurses for too high a proportion of their nursing services."[2]) The scheme would also bring to an end the damaging anomaly that in hospitals where nurses are trained for the State register the patients may be in danger of getting too little nursing attention, owing to the trainees' preoccupation with their studies and the rule that assistant nurses in training may not be employed in the same wards. But the whole plan would founder without recruitment of "assistant" nurses in large numbers; and this the arrangements so far proposed do not ensure.

The college may hope to increase recruitment of "assistant" nurses by its proposal to increase the number of training-schools for them. But this measure alone will not convince "assistant" nurses that they are not pursuing a second-best course. The very word "assistant" implies that they will be taking second place to nurses proper. If they are to do most of the practical work this title will be even more misleading than it is now; and it will continue to damage recruitment. The G.N.C. should overcome its hesitations and give these people the title they deserve—namely, nurse—finding other names for other groups. Furthermore, these nurses should be assured that if they show merit they can make the leap into the leaders' group. Such a provision is essential, not only because many are reluctant to start on a career in which there is no hope of progress, but because thereby the stock of leaders may be usefully enriched: the good practical nurse of 18 may emerge as an able administrator at 21. Indeed, can leaders be confidently selected at 18? Experience with candidates for other callings has encouraged no great confidence in selection methods, and such methods (as Dr. FOURMAN[3] remarks) must be especially hard to apply in a vocational profession. We still believe—as we believed twelve years ago[4]—that the choice of most of the leaders would best be deferred until basic training is completed. Besides encouraging recruitment of "assistant" nurses and easing the choice of leaders, this might help to preserve the unity of the profession. The offer of a different kind of training from the outset may attract to nursing some people with lively minds who otherwise would turn to other work; but any such gain may be offset by the isolation of the selected group from the practical nurses who from the start follow a different course. The unhappy effects of such isolation are evident in the United States, where university training has been carried much further than in this country. At present nobody knows whether leaders are best chosen before or after basic training or by other methods, including recruitment among older people, some of whom may have already graduated in arts or sciences at a university[4a]; and therefore meanwhile no one method should be followed to the exclusion of others.

Now some nurses, vigilant for their professional independence, question the doctor's right to be heard on these questions. "It is surprising," writes one correspondent,[5] "that doctors should consider themselves in a position to criticise nurse-education. Many nurses could make pertinent criticisms of medical education; except that they do not consider they have any right to do so." This overlooks the fact that the quality of hospital medical care depends largely on nursing skill: doctors cannot possibly remain indifferent to the way in which nurses are recruited and trained. The same correspondent writes: "Nursing, in the sense of caring for the sick, can be quite independent of medical care: it can be good, bad, or indifferent, so that the patient can be well treated medically but inadequately nursed. Similarly, the patient can be well nursed but inadequately treated." True; but where such division is manifest the patient is badly cared for. In the best hospital practice the nurse is the agent of the doctor in much of her work. Who shall say that the nurse keeping a fluid-balance chart, or recording a blood-pressure, or tending a patient recovering from anæsthesia is practising a nursing rather than a medical technique? And it is these very tasks—so often difficult and requiring much skill—that largely justify the recruitment of gifted people to nursing and the continuing growth of the profession's prestige. Dr. ANDERSON,[6] doubtless with such tasks in mind, wrote that nursing should develop along the lines of the needs of the doctor and of the public "whom we both serve." This drew from a senior nurse[7]

1. Observations and Objectives. Published by the Royal College of Nursing, Henrietta Place, London, W.1. See *Lancet*, 1956, ii, 1090.
2. Report of the Ministry of Health, 1955: Part 2: On the State of the Public Health. H.M. Stationery Office, 1956.
3. Fourman, J. *Lancet*, Jan. 19, 1957, p. 156.
4. *Ibid*, 1945, i, 664.
4a. See *Ibid*, 1956, i, 395.
5. Budge, U. V. *Ibid*, Jan. 19, 1957, p. 156.
6. Anderson, T. *Ibid*, Jan. 5, 1957, p. 45.
7. Lamb, M. *Ibid*, Jan. 19, 1957, p. 155.

the retort that "the nurse renders her service to the patient, not to the doctor"—a thought which, if carried far enough, would deny the nurse much of her most interesting and most rewarding work and would bring the routine of acute wards to a halt. More than one medical correspondent [8 9] has pointed out that a dangerous alternative to continued integration of medical and nursing work is the establishment of parallel services in which the nurses would communicate with the doctors (in Dr. RITCHIE RUSSELL's words [8]) "only through carefully delineated channels." In the ward, parallel services should have no place, because one person must take final responsibility: the care of patients cannot be conducted by committee. Such responsibility should, as hitherto, be vested in the clinician; and this arrangement, dictated by necessity, subordinates the nurse to the doctor no more than the hospital biochemist or physicist is subordinated to the doctor. Both doctor and nurse must wish to work towards easing tensions in their old and unbreakable alliance. The doctor's relation to the nurse differs from his relation to any other of the medical team. To the physiotherapist and the almoner, for instance, he turns intermittently, but to the nurse (as Miss EDWARDS remarks in her letter on p. 217) he looks for continuous and intimate help. Her eyes and ears, and many of her techniques, are extensions of his own. In hospital the doctor cannot work properly without the nurse's close support; nor can the nurse without the doctor's. It would be folly for either to pretend otherwise.

Ménière's Disease

IT is nearly a hundred years since PROSPER MÉNIÈRE described the condition which bears his name and related the symptoms to disturbed labyrinthine function. As far as clinical description is concerned, little has been added since. Classically, attacks of rotatory vertigo, often accompanied by vomiting, are heralded by increasing tinnitus and deafness. As the attack subsides, the tinnitus tends to become less prominent, but the hearing gradually or quickly deteriorates with each successive attack. Distortion of sound, which is a special feature of Ménière's disease, reduces still further the patient's ability to use his residual hearing. Psychological disturbances are common, and this is not surprising in patients who are ever expecting further attacks of disabling giddiness. It has therefore been said, with some justification, that any treatment applied with sympathetic interest is likely to be helpful.[10] This fact, and the natural tendency to remissions of up to several years, combine to make the assessment of any treatment a long and difficult task.

Elucidation of the pathological basis of Ménière's disease has lagged a long way behind its clinical recognition, because opportunities for post-mortem studies were few, and even those examinations that were possible were made technically difficult by the ivory-hard bone surrounding the internal ear. It was not until 1938 that HALLPIKE and CAIRNS [11] demonstrated that the essential lesion is a dilatation of the endolymphatic system, accompanied by a degeneration of the sensitive cochlear and vestibular end-organs. They suggested that the sudden attacks of vertigo began when the endolymphatic pressure rose to the critical point at which the blood-vessels were obliterated, and the resultant ischæmia paralysed the end-organ. Since then, hydrops of the labyrinth has often been confirmed as the lesion of Ménière's disease; but the mechanism of this accumulation of endolymphatic fluid has not yet been satisfactorily explained. Among the many hypotheses put forward, vasomotor disturbances in the internal ear have commanded most interest in recent years: an allergic vascular spasm,[12] a Raynaud-like mechanism,[13] and autonomic imbalance [14] are among the most acceptable. The autonomic nervous system has no direct influence on the organs of hearing and balance, but stimulation of the sympathetic trunk in cats can reduce the blood-flow through the spiral ligament.[15] The endolymph is produced more slowly after sympathetic stimulation and it is altered in character, so that later the endolymphatic pressure rises as a result of osmotic exchanges. LEWIS [16] believes that there is some primary fault within the labyrinth, which produces its effects by way of the vascular supply to the internal ear. Sympathectomy, by its action on the blood-vessels, modifies the course of the disease without affecting the primary cause.

Medical treatment is often successful. The use of sedatives or anti-histamine preparations aims at reducing the immediate symptoms until the organism has had a chance to readjust the endolymphatic balance. Fairly large doses of vasodilator drugs, such as nicotinic acid, may help the patient to achieve this balance more quickly and to maintain it; and they have enabled up to 90% of patients to return to and remain at work.[17] But for those patients who do not promptly respond to conservative treatment, and who have only a distorted and useless remnant of hearing, surgical destruction of the diseased labyrinth offers the surest escape from the demoralising attacks of vertigo, with their dangers to life, limb, and livelihood.[10]

There remains a small, difficult, but interesting group in which surgery is required because medical treatment has failed, but in which it is important not to destroy the hearing in one ear. The indications for such conservative surgery have recently been set out by HARRISON [18]: in patients with unilateral disease, a conservative operation may be considered for those with good hearing in the affected ear and those whose hearing on the opposite side is reduced by some other cause; and when the disease is bilateral, it is always desirable to halt the loss of hearing as well as the vertigo. But the chief defect of all the conservative operations is the uncertainty of preserving the hearing while abolishing the vertigo. PORTMANN's operation [19] of draining the saccus endolymphaticus has been used intermittently since 1927. Logical though the method seems, the results have seldom been satisfactory. FLETT [20] says the operation offers a 25% chance of retaining the hearing and relieving

8. Russell, W. R. *Ibid*, 1956, ii, 1261.
9. Macbeth, R. *Ibid*, Jan. 12, 1957, p. 96.
10. Cawthorne, T. *J. Laryng.* 1956, **70**, 695.
11. Hallpike, C. S., Cairns, H. *Ibid*, 1938, **53**, 625.
12. Williams, H. L. Ménière's Disease. Springfield, Ill., 1952.
13. Atkinson, M. *Proc. R. Soc. Med.* 1946, **39**, 807.
14. Passe, E. R. G. *Arch. Otolaryng., Chicago*, 1953, **57**, 257.
15. Seymour, J. C., Tappin, J. W. *Acta oto-laryng., Stockh.* 1953, **43**, 618.
16. Lewis, R. S. *J. Laryng.* 1956, **70**, 673.
17. Kodicek, J., Taylor, L. R. S., Bateman, G. H. *Ibid*, 1950, **64**, 647.
18. Harrison, M. S. *Ibid*, 1956, **70**, 680.
19. Portmann, G. *Ibid*, 1927, **42**, 809.
20. Flett, R. L. *Proc. R. Soc. Med.* 1954, **47**, 672.

the vertigo and tinnitus, and a 60% chance of relieving vertigo but with a gradual loss of hearing. Limited operations on the vestibular labyrinth [18] seldom succeed, since any sort of intralabyrinthine instrumentation in Ménière's disease usually leads to complete loss of both cochlear and vestibular function. If some function is retained, both the cochlear and vestibular elements may well continue their disordered action as they did before the operation. The intracranial division of the vestibular portion of the 8th nerve is a major operation, but in most cases reported in this country [10] and elsewhere the patient has retained his hearing. It is undertaken in bilateral disease to salvage the better-hearing ear, and in some unilateral cases with good hearing. Destruction of vestibular function without operation has been achieved with streptomycin. Unfortunately both sides are affected, making the treatment most suitable for the younger patient with bilateral disease—an unusual combination. To offset the total loss of vestibular function calls for considerable adaptation which the elderly find very hard to achieve, and the resulting incapacity may be greater than before.[21] The drug may also damage further the already declining hearing, and a very careful check must therefore be kept on the state of the hearing. Any further deterioration means that the streptomycin must be stopped at once. The vestibule has also been successfully destroyed on one side by ultrasonic rays,[22] but in this country the efficacy of this method has not yet been assessed.

Cervico-dorsal sympathectomy is a method of treatment of which more has been heard lately. LEWIS [16] and HARRISON [18] found that injection of the stellate ganglion was not a success either in treating the attacks of giddiness or in selecting cases for operation. On the whole, patients with unilateral disease did better after sympathectomy than those with both ears involved, probably because the disease is usually more severe when both ears are affected. It is interesting that the improvement or disappearance of the vertigo was sometimes delayed for up to a month after the operation. Many of their patients have had no further loss of hearing over the course of several years; and the operation is probably effective in preventing or retarding the progression of the deafness. The place of sympathectomy in the treatment of Ménière's disease, however, seems to be limited to those few patients in whom the disease is bilateral and the deafness progressing in spite of medical treatment. Early operation may preserve the hearing, but improvement of hearing after late operation is rare.

Pressure and Flow in Arteries

THE formula devised by FRANK [23] expressed the relationship between arterial pressure and flow as resistance, and measured it in the specific terms of dynes per cm.$^{-5}$ per second. This is a convenient single expression connecting pressure and flow, but it is almost certainly not a valid measure of the peripheral resistance of the cardiovascular system. FRANK's formula is based on Poiseuille's law, which was intended to define the relationship between pressure and flow of an ideal liquid passing steadily through a rigid tube of uniform calibre. But in the mammalian circulation a pulsating stream of a complex suspension flows through elastic tubes, with changes of velocity and cross-sectional area at each subdivision of the network. The relation of pressure to flow must therefore be clarified before FRANK's formula can be applied to the circulation in anything but a casual way. The ultimate aim of many inquiries into pressure and flow has been to measure cardiac output from an aortic or arterial pressure tracing; and with this object in view the arterial system as a whole has been investigated. Eventually, HAMILTON and REMINGTON [24] put forward an empirical formula which related various parts of the aortic-pulse contour to the volume of the blood ejected from the heart. The formula gave a reasonable prediction of the cardiac output of the dog under specified conditions, but it failed to do so when the conditions were altered.[25] This and other careful investigations have made it clear that our present views on hæmodynamics cannot fully explain the pressure and flow changes observed in the animal circulation as a whole.

It seems that progress will be faster if the complex problem can be broken down into its constituent parts. COULTER and PAPPENHEIMER [26] studied the seemingly straightforward matter of the physical properties of blood flowing along a tube; and, as might have been feared, these turned out to be far from simple. Though the "viscosity" of blood may be measured, the measurement has meaning only if it is made under conditions which are closely and clearly defined. When blood flows along a tube, the corpuscles flow in an axial stream and the viscosity of the blood varies with the velocity of the stream and the area of cross-section of the tube. When the velocity is great, as in the aorta during systole, turbulence develops [27] and the effective viscosity of the blood is much increased. These findings upset the simpler ideas of blood viscosity: for example, it is usually held that viscosity must be increased when the red-cell count rises; but this is true in only a limited sense, for PAPPENHEIMER has shown that at high velocities of flow the effective viscosity of polycythæmic blood may be less than that of normal blood, because the increased mass of the corpuscles tends to stabilise the stream and make turbulence less likely. The problem has also been simplified by investigating only a part of the circulation. LANDIS [28] measured pressure, diameter, length, and rate of flow in the arterioles and capillaries of the frog's mesentery; and GREEN et al.[29] studied the connection between mean pressure and flow in the perfused hind leg of the dog. Both inquiries made it plain that many adjustments were needed before the observations could be combined in a relationship based on Poiseuille's law. PETERSON [30] injected a known volume of blood into the aorta of a dog at selected instants during the pulse cycle, and showed that

21. Cawthorne, T., Hewlett, A. B. *Ibid*, p. 663.
22. Arslan, M. *Minerva otorinolaring.* 1953, **3**, 141.
23. Frank, O. *Z. Biol.* 1928, **88**, 245.
24. Hamilton, W. F., Remington, J. W. *Amer. J. Physiol.* 1947, **148**, 14.
25. Remington, J. W. *Fed. Proc.* 1952, **11**, 750.
26. Coulter, N. A. jun., Pappenheimer, J. *Amer. J. Physiol.* 1949, **159**, 401.
27. McDonald, D. A. *J. Physiol.* 1955, **127**, 533.
28. Landis, E. M. *Amer. J. Physiol.* 1933, **103**, 432.
29. Green, H. D., Lewis, R. N., Nickerson, N. D., Heller, A. L. *Ibid*, 1944, **141**, 518.
30. Peterson, L. H. *Circulation Res.* 1954, **2**, 127.

equal injections did not cause identical or even predictable superimpositions on the pressure pulse curve. In his view, the systolic force needed to impart linear acceleration to the blood-mass in the arterial tree is an important consideration in pressure-flow changes within the aorta. McDONALD [27] and WOMERSLEY [31] have re-examined pressure and flow in the dog's femoral artery under standard conditions. They measured the changes of pressure gradient between two points along the artery; and the coincident changes in blood-flow velocity were recorded by means of high-speed photographs of an oxygen bubble in the artery. They found that the oscillating pressure-gradient was related to the volume-flow which it generated after a time lag, in rather the same way that an alternating voltage is related to the corresponding current. In fact, WOMERSLEY has devised an "alternating-current" theory of flow, to be distinguished from the relationship based on Poiseuille's law (which can be considered as the "direct-current" theory). According to the "direct" theory, it may be permissible to think and speak of the sum of the resistances of the branches of a network of vessels; but when there is an oscillating pressure in a branching system it would be more correct to consider the effect of branching as analogous to a sum of impedances. Using the "alternating" theory of flow and the standard principles of hydrodynamics, the flow to be expected over a known pressure-gradient in the femoral artery was calculated, and the agreement between the observed and calculated volume of flow was within the limits of observation error. Thus, the theory seems to have been justified.

Observations by BURCH [32] encourage the hope that similar fundamental work may be possible in man, using relatively simple methods. BURCH used venous-occlusion plethysmography to measure the phasic changes of blood-flow in the finger. The finger-tip is enclosed in an airtight rigid container which does not obstruct the circulation. When the venous outflow is briefly occluded by a pressure cuff on the finger, the volume distal to the cuff increases by the amount of blood flowing into it during the period of occlusion; and equal volumes of air are displaced to and from the plethysmograph into a continuous recording system. Until now it has been customary to measure the mean rate of blood-flow over a brief period, though the original description of the plethysmographic method by HEWLETT and VAN ZWALUWENBURG [33] was much concerned with observations of the phasic changes in the rate of flow. BURCH has adapted the finger plethysmograph to record the rapid changes of flow into the finger during the phases of the pulse cycle. To this technique he has given the cumbersome name of electro-rheoplethysmography; but perhaps the title is justified since he observes the time-course of the volume changes, the rate and acceleration of inflow and outflow, and the difference between inflow and outflow of a single pulse cycle. Tracings are taken from two fingers simultaneously, and the venous outflow of one is intermittently occluded, the other serving as a control for spontaneous changes in the finger-volume. The rate of volume-change can then be measured over any portion of the pulse cycle. The first derivative of the volume-time chart gives the time-course of the inflow and outflow rate, and the second derivative the acceleration-rate of the blood inflow. The form of such curves has yet to be related to the form of the arterial and venous pressure pulses. They vary considerably in different physiological and clinical states, and the study of these changes is likely to further our knowledge of the function of the central and peripheral circulation in health and disease.

But it is doubtful whether the finger-tip is the most suitable part in which to study the circulation. The smaller vessels of the digits are specialised to take part in the control of body-temperature, and they are particularly rich in arteriovenous anastomoses,[34] which are readily opened and shut by thermal and nervous stimuli. For this reason blood-flow fluctuates widely in the finger-tips, and it might also be expected that there would be an unusual range of pressure-gradient between the arterial and venous ends of the capillaries. Observations on these vessels, therefore, cannot be interpreted as typical of the circulation as a whole. Furthermore, plethysmographic records from the finger-tips may be unsatisfactory for technical reasons. The part of the inflow curve from which reliable readings may be made is limited by the artefacts caused by the inflation of the cuff at the beginning of the curve and by venous congestion at the end. When the vessels are dilated and the arteriovenous anastomoses widely open, the artefacts may so approach each other that no reliable estimation of the blood-flow can be made. BURCH considers possible methods of dealing with these limitations, but his suggestions are not entirely convincing; and the forearm or calf might be a better part of the anatomy to investigate.

These important and interesting investigations bristle with technical difficulties. Electromanometers are not hard to find, so that the recording of phasic pressure changes in the cardiovascular system is relatively simple; but the simultaneous recording of phasic flow changes is a different matter. Improved methods, however, will probably simplify the present abstruse picture of pressure and flow. Meanwhile, there should be no serious objection to expressing the relationship between mean pressures and mean flow in terms of "peripheral resistance," so long as it is clear that the term is no more than an arithmetical arrangement of pressure and flow measurements, and that a change of "peripheral resistance" does not necessarily denote a change of calibre of arterioles or "resistance vessels."

31. Womersley, J. R. *J. Physiol.* 1955, **127**, 553.
32. Burch, G. E. *Circulation*, 1956, **13**, 641.
33. Hewlett, A. W., Van Zwaluwenburg, J. G. *Arch. intern. Med.* 1913, **12**, 1.
34. Grant, R. T., Bland, E. *Heart*, 1931, **15**, 385.

The New Minister of Health

Mr. DENNIS VOSPER has been appointed Minister of Health in Mr. Macmillan's Government.

Mr. VOSPER, who is 41, was educated at Marlborough College and Pembroke College, Cambridge. During the late war he served with the Cheshire Regiment and held the rank of major. He was returned to Parliament as member for the Runcorn division of Cheshire in 1950, and the following year he became a Lord Commissioner of the Treasury. From 1950 to 1954 he was a whip. As parliamentary secretary to the Ministry of Education since 1954 he has taken a special interest in the welfare of handicapped children.

Mr. J. K. VAUGHAN-MORGAN, who has represented Reigate since 1950, has been appointed parliamentary secretary to the ministry. He has been chairman of the Conservative health committee.

Annotations

SAVING THE POTENTIAL SUICIDE

"O Britain infamous for suicide!" wrote the Rev. Edward Young [1] in 1742, and he might still thus apostrophise our nation. As Dr. Parnell and Dr. Skottowe observe in their article on p. 206, the Registrar-General recorded, in 1954, in England and Wales, 5043 suicides—which represented an increase of nearly 50% in ten years. In Britain today, more people commit suicide than are killed on the roads. Of the 100 suicides about which they gathered information, Parnell and Skottowe found that in 53 the victim had not recently been under medical care. But in the majority there had been warning signs, of which a change of mood, with noticeable depression, was the commonest. As Parnell and Skottowe see it, the best chance of saving the man or woman with thoughts of suicide is admission to a mental hospital for supervision and treatment: but they acknowledge the difficulties of convincing not only the patients but their families and the general public of the importance of this precautionary measure.

From the general practitioner's viewpoint depression is so common a symptom that it is often hard to pick out the patient who is heading for disaster. In ten years Watts [2] saw 387 patients with endogenous depressions, including 6 who committed and 8 who attempted suicide; 3 of those who killed themselves were not under medical care at the time. As Craddock [3] has pointed out, it is all too easy to overlook endogenous depression; for, like cancer and tuberculosis, it usually comes on insidiously. Oliven,[4] among others, has offered useful advice to the family doctor who must decide whether or not a patient is in danger of suicide. In his view, even vague or minor signs of depression, and its concomitants, such as insomnia, loss of appetite, and libido, and abnormal fatigability, should be taken as danger-signals, though the greatest care will never save the occasional patient who commits suicide without warning. More could perhaps be done by reminding the public that depression is a reason for seeking medical advice. And certainly, as Parnell and Skottowe emphasise, doctors must be less chary of asking frank questions about how depressed the patient is and whether he has any suicidal intentions. The depressed patient more often escapes notice than the psychopath, the schizophrenic, or the alcoholic; and "that a patient does not threaten suicide, or again that he speaks logically, is no excuse for inaction."

But the best answer may lie further back—in a livelier awareness, among public and profession, of what can be done by the preventive measures of social psychiatry and psychotherapy.[5] A world of unstable international and national conditions and loss of faith may favour despair in people who are not so stuffed with bread and circuses that they doze through their waking hours. The man who says "I couldn't care less" may be closer than he knows to taking an action which will relieve him of the need to care any more about anything. Another even more depressing view is that the importance of the individual and his welfare has been so overplayed in some countries that the will to struggle for life and livelihood has been lessened, and will not be restored until the cushion of the Welfare State is made a bit harder. However that may be, it is, in the first place, to preventive psychiatry that we must turn for real help in reducing the number of suicides and in enabling those that are saved to find stability, even in an unstable world.

1. Young, Rev. E. The Complaint, or Night Thoughts on Life, Death and Immortality. London, 1742.
2. Watts, C. A. H. *Brit. med. J.* 1956, i, 1392.
3. Craddock, D. Introduction to General Practice. London, 1953.
4. Oliven, J. F. *New Engl. J. Med.* 1951, **245**, 488; see *Lancet*, 1951, ii, 1026.
5. See *Lancet*, 1956, ii, 1087.

FAILURE OF ARTERIAL GRAFTS

THE commonest site for advanced degenerative disease of peripheral arteries is at the junction of the femoral and popliteal arteries, and from here the clot spreads upwards or downwards. It is unfortunately quite clear that the results of direct vascular surgery have been very unsatisfactory in these limb vessels, and the causes of early and late failures in grafting are therefore of the greatest interest. Several possible causes demand attention. First, the surgeon may be technically at fault by creating a stricture at the anastomosis between the graft and host artery, so that thrombosis inevitably follows. That this is of great importance is suggested by the superior results of grafting when big vessels such as the aorta or iliacs are involved. It is equally certain that the use of small vessels, such as the posterior tibial, for the distal anastomosis is followed by a 100% thrombosis-rate. Other technical faults are the lifting and loosening of atheromatous plaques by the needle point or the leaving of too much free silk within the lumen in contact with the bloodstream. Because of the larger lumen which can be fashioned, the end-to-side type of anastomosis is less likely to thrombose than the end-to-end type. The kind of graft which is most suitable for peripheral arteries is still a matter for debate. Free vein grafts, homologous arteries, and tubes of synthetic fibres all have their supporters: of the man-made fibres, polyvinyl alcohol seems most promising. The benefits of crimping the graft to make it flexible without kinking have been shown in vivo to be short-lived because the invading connective tissue rapidly converts it into a smooth semi-rigid structure.

Szilagyi et al.[1] have confirmed some of the earlier reports of degeneration, thrombosis, calcification, and aneurysm formation following the use of homologous arterial implants. The problem of homograft degeneration is a difficult one; and data regarding the source of the grafts and their processing or storage do not help. The way in which host tissues vary in their acceptance of homografts of grossly similar characteristics suggests that the host-graft reaction may be an immunological one.[1]

The factor which has most to do with success or failure may be the selection of the patients. There is no doubt that results of grafting for traumatic or congenital lesions of arteries are much more satisfactory than those of operations undertaken for arteriosclerosis; and, in the arteriosclerosis group, vessels with relatively localised segmental thromboses do much better than those in which the narrowing involves the whole tree. Furthermore, the degeneration is progressive and the relief of a localised thrombosis is often followed by further lesions elsewhere in the leg.

Szilagyi et al.[1] reviewed their experience with 120 homograft operations for aorto-iliac or femoro-popliteal occlusions. In 23 there was clotting immediately after the operation. During the next thirty-three months, 21 more grafts failed to transmit blood. 7 of these were re-explored and studied clinically or histologically. Szilagyi et al. concluded that the most common cause of late graft failure was the extent and severity of the pre-existing arterial disease. Occlusions due to defects in the homografts which developed after their implantation were uncommon, but there was often progressive narrowing or unevenness in the follow-up angiograms and this might lead to eventual obstruction. Szilagyi et al.'s paper was read before the American Surgical Association,

1. Szilagyi, D. E., Whitcomb, J. G., Smith, R. F. *Ann. Surg.* 1956, **144**, 611.

and from the discussion which followed it was clear that many surgeons were uneasy about the results of small-vessel grafting. The proportion of late closures in the region of the femoral artery was as high as 70%. The variation in failure-rate reflects differences in the original selection of patients and indeed illustrates the outstanding clinical problem for the vascular surgeon. Should he select only those patients with early disease and moderately severe symptoms in whom the results of grafting are fair: or should he reserve direct surgery for very advanced disease, in which the results are in general poor but occasionally dramatic?

AUSTERITY DIETS

THE National Food Survey has been in being since July, 1940. Year by year it has recorded the food consumed in many thousands of households, and analyses of these data enable some assessment to be made of how the food consumption of the people measures up to accepted standards of physiological needs. The Survey's findings were of great value to the Ministry of Food in planning and coördinating its policy during the late war and immediately afterwards, when food was scarce. During those years the staff of the Ministry had not the time to analyse fully the mass of data available and to present the results in a scientific report. When the pressure of the times became less heavy, the Ministry concentrated, very wisely, on the preparation of up-to-date annual reports, of which the first to be published was for 1950; but a report was also prepared which gave some account of the trends in the earlier years. A second report [1] now issued presents a large selection of the information available for the years 1944–49. It was not possible to fulfil the original programme which included the earlier years—for one thing, old punched cards get worn and unusable—but the new report does cover the period when food was most scarce and the rationing system most strict; it is an important historical document describing household diets when the war-time system of controls was in full operation. The pre-war free economy, with much unemployment and social inequality, had been replaced by a controlled economy, with strict rationing of basic food, and by full employment.

It is at once apparent from the report that this change had profoundly altered food consumption. Boyd Orr demonstrated that in the pre-war years about 10% of the population (that is some 4 million people) were living on diets which were deficient in both quantity and quality; and this estimate has never been seriously challenged. Yet, in the years 1944–49, no section of the community was eating a diet which fell significantly short of the standards set by the British Medical Association. Higher wages enabled the working man to buy for his family a better diet; but for the middle classes there was a real reduction in the variety and palatability of their food. The country's food, though wholesome and nutritionally adequate, was dull.

The report tries to determine how the diet was affected by various circumstances. One chapter records details from families who were badly housed, but it turns out that their diets differed surprisingly little from those consumed in other working-class homes. Another chapter shows that family size determines the quality of the diet far more than the occupation of the parent. The amount of milk, meat, vegetables, and fruit consumed was significantly less in families with four or more children, and in this group the protein intake was below the B.M.A. recommendation in all groups of working-class families.

Separate analyses are given for the households of agricultural workers, miners, builders, metal-workers, and ship-builders, but the differences are remarkably small. Of more interest is the analysis of the regional differences. Less fruit, vegetables, fish, rationed meat, and eggs were eaten in Scotland than in any other part of the country, but the Scottish consumption of cakes, buns, and scones was 12% above the national average. The Scots spent only $^1/_{10}d.$ a head per week on coffee, whereas the English spent a $^1/_2d.$ In England, most cheese was eaten in the Midlands, most fruit in London, most potatoes in the South-West, and most cereals in the North-East. It might be interesting to try to relate these variations to the incidence of degenerative diseases. For those concerned with atheroma, it is perhaps unfortunate that fat consumption in the home seems to have been remarkably uniform and almost independent of social class, occupation of wage-earner, number of children, or region.

The committee responsible for this report have presented skilfully, clearly, and concisely a large amount of information, to which many research-workers, among others, will turn with interest.

CONSTRICTIVE PERICARDITIS

THE diagnosis of constrictive pericarditis is seldom difficult, if the possibility of the condition is borne in mind and if special investigations are carried out to confirm the diagnosis in atypical cases. No age is immune, and, though many patients are under 40, older patients may have constrictive pericarditis which may be misdiagnosed as ischæmic heart-disease. The cardinal symptoms are shortness of breath on exertion, swelling of the ankles, and distension of the abdomen; the cardinal signs, found in almost every patient, are a raised jugular venous pressure and an enlarged liver. Often there are a pleural effusion, ascites, a paradoxical pulse, a loud third heart-sound, and a reduced pulse-pressure, but these are not essential to the diagnosis. In half the patients the heart-size is normal on fluoroscopy, and the remainder have only slight or moderate cardiac enlargement. Usually the cardiac pulsation is diminished, but in a quarter of the cases the radiologist reports that movement is not restricted, even though he knows the diagnosis and it has been confirmed by other means.[1] Calcification of the pericardium is a helpful finding, but it is seen in only about half the cases, even when tomography is used. The electrocardiogram is always abnormal but never characteristic. There is usually flattening or inversion of the T waves; and three-quarters of the tracings show wide or notched P waves which closely resemble the P-mitrale of mitral stenosis.[1]

Cardiac catheterisation is invaluable in confirming the diagnosis and also in assessing the degree of cardiac embarrassment in the rare symptom-free patient who is found by chance to have a calcified pericardium. The characteristic findings are a raised end-diastolic right ventricular pressure, an early diastolic dip-and-plateau pattern in the right ventricular pressure tracing, and (depending on the degree of left ventricular involvement) a raised pulmonary capillary pressure.

The disease is progressive, and once there are symptoms operation is indicated. The operative mortality is 10–15%, but better results may be expected as surgical techniques improve and patients are operated on at an earlier stage, before the onset of auricular fibrillation and severe liver damage. Recurrences are common (of 78 patients, 11 required more than one operation [1]); but the need for second or third operations will cease when wider incisions are used, to allow of a more extensive pericardectomy, and when anti-tuberculous drugs are

1. Studies in Urban Household Diets, 1944–49. Second Report of the National Food Survey Committee. H. M. Stationery Office, 1956. Pp. 143. 5s. 6d.

1. Dalton, J. C., Pearson, R. J. jun., White, P. D. *Ann. intern. Med.* 1956, **45**, 415.

given in adequate amounts for an adequate period.[2] Bigelow [3] and his associates recommend a trans-sternal approach with both sides of the chest open. All the pericardium over the left and right ventricles is removed, including that over the apex and diaphragmatic surface. The phrenic nerves are dissected out and the pericardium posterior to them removed. Such a wide exposure allows the venæ cavæ to be cleared and permits speedy repair of the myocardium if the heart is inadvertently opened. Bigelow keeps his patients on digitalis in the belief that this prevents postoperative myocardial dilatation. Further improvement can be expected for several months after pericardectomy, and the Canadian workers report that venous filling pressures have continued to drop for up to a year after operation.

RICHARD PFEIFFER

Koch, Ehrlich, Behring, Gaffky, Loeffler, Carl Fraenkel, Wassermann, Frosch, Wernicke, Kolle, and Richard Pfeiffer—those were some of the staff of the Institute of Hygiene of the University of Berlin in 1887. It is unlikely that so many men of ability have ever pursued the same end with so much vigour under the same roof. The games in Valhalla are traditionally hearty, and, knowing German habits in scientific debate, one can be pretty certain that discussion sometimes passed the limits of ordinary politeness. It was the golden age of Germany and of bacteriology, and it is characteristic of the purposeful vigour of the times that a thesis on the bacteriology of water was considered grounds for seconding Pfeiffer, an army surgeon of 29, to the institute. The choice was wise and from it stem two lines of inquiry which are still productive. Pfeiffer's bacillus (which we now call *Hæmophilus influenzæ*) has been dethroned from its place as the "cause" of influenza, but, as Sir Paul Fildes points out in an account [4] of Pfeiffer's life, his observations on the fractions of whole blood necessary for the growth of this organism were the first steps in the path which Fildes has himself trodden—with much distinction. Pfeiffer was, in fact, the father of the study of bacterial nutrition; but in those years at the Institute of Hygiene in Berlin his most famous work was probably the demonstration of the "Pfeiffer phenomenon"—the lysis of cholera vibrios injected into the peritoneal cavity of an immunised guineapig. Like most of the fundamental observations at that time, this was made in the course of experiments designed to solve a problem of practical hygiene. The administrative measures recommended by Koch to combat an epidemic of cholera in Hamburg in 1892 were founded on the assumption that the disease was due to *Vibrio choleræ*. The discovery of saprophytic vibrios in many places gave an urgent need for a method by which these might be distinguished from *V. choleræ*. Pfeiffer showed this could be done by cross-immunity experiments in guineapigs. *V. choleræ* injected into the normal animal multiplied freely: in an animal immunised with the same organism the vibrios swelled and vanished. In the presence of immune serum the same thing happened in vitro—as readily with the typhoid bacillus as with the cholera vibrio. It was indeed the "crowning mercy" in the long debate on the relative parts played by cellular and humoral defences in overcoming infection. Pfeiffer followed several lines of inquiry from this original observation and most of them have been fruitful in his hands or in those of others. Immunology had arrived.

Pfeiffer assisted Koch in his investigations into plague in India and malaria in Italy. He obtained the chair of hygiene and bacteriology at Königsberg and later at Breslau, where he remained until his retirement in 1926. Shortly before the late war he moved to a small watering-place in the neighbourhood. He was still co-editor of the *Zentralblatt für Bakteriologie*; he read avidly; he played the piano and tended his garden. He was surrounded by devoted friends and the war was far away. In 1945 Silesia was occupied by the Russians. Pfeiffer could not or would not leave, and he died in September, 1945, cared for by an old maidservant. It was only recently, however, that this was known for certain by his friends in the West. So passed almost the last survivor of the heroic age of bacteriology, a man whose contributions to knowledge have benefited the whole world of learning.

2. See leading Article, *Lancet*, 1952, i, 1055.
3. Bigelow, W. G., Dolan, F. G., Wilson, D. R., Gunton, R. W. *Canad. med. Ass. J.* 1956, **75**, 814.
4. Fildes, P. *In* Biographical Memoirs of Fellows of the Royal Society. Vol 2. November, 1956.

SEPSIS IN THE NEWBORN

SEPSIS neonatorum can be troublesome in most maternity hospitals and departments, and anything that reduces its incidence is worth considering. Commonly the primary infection is in the skin, and Bruce [1] has carefully investigated the incidence of soreness and sepsis in the skin in a group of newborn children bathed in the usual way, and compared it with the findings in a group in which a semi-dry technique was used (only the face and napkin area were cleaned, with dilute (1 in 500) cetrimide). She found that the differences between the two groups were not significant; but, because it saved labour, lessened handling by the nurses, and allowed the baby to spend more time by its mother, the non-bathing technique was introduced into the hospital as a routine.

Though the investigation was very carefully controlled, it was not conclusive as far as sepsis is concerned, since two important features in the natural history of the disease were not considered. Firstly, the incidence is irregular. There are periods of many months when infection is quiescent: few babies are affected, and the lesions are mild; then quite suddenly an outbreak flares up with widespread infection and severe lesions, reaching a peak and subsiding within a month or so. Secondly, the clinical manifestations are not confined to the period spent in the maternity department. A relatively small skin lesion appearing in the first week may heal rapidly and all is thought to be well; but there may be a smouldering focus of infection, or perhaps a bacteræmia which bursts out again with septicæmia and a "fixation" abscess in bone or lung as much as sixteen weeks later. These cases, by far the most important, appear in the pædiatric wards, and on inquiry it is common to find that almost all the children were born in hospital even in an area where half the babies are delivered at home.

Bruce conducted her investigation in a hospital where there are some 2000 deliveries a year, and it covered a period of four months, with 160 and 129 infants in the two groups. An investigation lasting two years and including about 1000 infants in each group would have been more conclusive, because there would probably have been at least one flare-up in that time. The observations were limited to the lying-in period, presumably fourteen days or less; a follow-up of four months might have revealed some sepsis later.

MEDICAL EDUCATION

WE have already mentioned [2] a conference called by the Royal College of Physicians of London on Nov. 23 to consider the formation of some permanent organisation for discussing problems of medical education, for exchanging information, and for further research. The college's initiative was welcomed by the conference, most of whose 69 members came from teaching schools and licensing bodies, and a steering committee was appointed to report on the possible form and scope of such an organisation. This is to meet shortly.

1. Bruce, L. *J. Obstet. Gynæc., Brit. Emp.* 1956, **63**, 735.
2. *Lancet*, 1956, ii, 897.

Special Articles

TOWARDS PREVENTING SUICIDE

R. W. PARNELL
D.M. Oxfd, M.R.C.P.
NUFFIELD RESEARCH PHYSICIAN

IAN SKOTTOWE
M.D. Glasg., M.R.C.P., D.P.M.
PSYCHIATRIST

WARNEFORD AND PARK HOSPITALS, OXFORD

DEATHS by suicide in England and Wales have been increasing, especially in the past few years. In 1954 there were, according to the Registrar-General (1954), 5043 suicides compared with 3447 in 1944—an increase of 1596 (46%). In recent years, moreover, their number has exceeded that of fatal road accidents, yet they attract much less public attention, and their prevention is seldom publicly discussed.

Suicide is commonly committed in a mood of depression. Since this state of mind is usually amenable to treatment, it should be possible, by earlier and more effective recognition of it, to reduce the number of suicides. The fact that suicides have increased with more widespread use of physical treatments has led some workers—e.g., Frost (1956)—to question whether physical treatments are being adequately supported by other measures, or even, it seems, to question the value of electroconvulsion therapy, although Maclay (1953) has called attention to evidence (Huston and Locher 1948, Fetterman et al. 1951, Slater 1951) of the preventive value of electroconvulsions.

Four Questions

The general attitude to suicide varies in different cultures; but, if it is accepted that suicide should be prevented, all possible steps, both medical and social, towards this end need examining. The prospect for more effective prevention depends on the answers to the following questions:

(1) Is there a sufficiently large proportion of actual suicides who have not received full medical and social help?

(2) If so, what warning signs can be discerned?

(3) Is there evidence that admission to mental hospital is preventive not only in the sense of immediate prevention by constant observation but also in the sense of reducing the prospect of future attempts?

(4) What evidence is there of the frequency of particular diagnoses among those attempting or committing suicide, and that those showing warning signs could be persuaded to enter mental hospitals, if most of them were not so manifestly ill as to warrant the making of an order under the Lunacy and Mental Treatment Acts (1890–1930)?

EXTENT OF MEDICAL HELP

That a large proportion of suicides have not received help is shown by a series of 100 consecutive suicides from inquest registers of 1949–56 together with the information kindly provided by two coroners who noted whether the suicide had been under medical care:

Not under medical care (including 4 where it was refused) ..	53
Under medical care:	
Under general practitioner	17
Under general practitioner and consultant psychiatrist ..	10
History of having been in a mental hospital during the past year or so *	13
Not known	7
	100

* Among the remainder there were 7 who had been admitted to a mental hospital more than a year before committing suicide.

The majority had not received medical care and, so far as is known, only 13% had been lodged at some time during the year or so before their deaths in a mental hospital, and 27% had recently attended their medical practitioner but had not been admitted to hospital. This analysis suggests that there is plenty of scope for prevention, provided that warning signs are recognised.

WARNING SIGNS

A previous attempt at suicide had been made in 11 cases. Sainsbury (1955) reported 9%. Statements such as that death came as a surprise were recorded in only 6 cases altogether, and even here not always as a surprise to all the suicide's associates, although it was to either family, doctor, or employer. It seems that warning signs were present in the majority. Their recognition comes next and supports this first impression of their frequency. One coroner had recorded statements to the effect that the deceased had been noticeably depressed or worried in 42 of 74 (57%) of his cases, and in 8 others comments concerning insomnia, violent temper, or nervous breakdown suggested the relevance of psychiatry. The next largest group, 21 of 74 (28%), was associated with recent surgical operations (8 cases), recent childbirth (2 cases), long-lasting pain or severe illness (9 cases), and fear of this or fear of mental illness or mental hospital (2 cases). In the third group social causes related to marriage or remarriage (5 cases) and to fear of or impending legal action (4 cases).

In summary, so far it may be said that a change of mood with the appearance of depression, worry, or hopelessness appears as much the commonest warning sign.

PREVENTIVE EFFECT OF ADMISSION

The number of suicides during residence in a mental hospital is small; for example, in 1954 there were only 51 suicides in mental hospitals out of the total of 5043 among the general population. The suicide-rate in mental hospitals was slightly higher than in the general population, but the mental-hospital population is much more highly disposed, as can be inferred from the frequency of attempted suicide among patients before admission to mental hospitals. In our psychiatric and somatometric survey of newly admitted patients at four mental hospitals in the Oxford region we found that an attempt at suicide was a prominent reason for admission in 9% of 445 men and 10% of 521 women. Furthermore, there was a history of a previous attempt in another 3% of men and 6% of women. In so far as these proportions are representative, the figures enable an estimate to be made of the number of attempted suicides leading to admission to mental hospitals throughout the country. This may be compared with the actual number of suicides:

	Men	*Women*
Admission to mental hospitals in England and Wales (1954)	29,751	41,948
Estimated proportion attempting suicide ..	9%	10%
Estimated number attempting suicide ..	2678	4195
Actual number of suicides	3178	1865

It is evident that a much greater proportion of men commit suicide than of women. On the other hand, more than twice as many women attempt suicide unsuccessfully and gain admission to hospital as kill themselves. These figures, of course, exclude many suicidal attempts not leading to admission to mental hospitals and cases of suicide where an open verdict is returned for lack of evidence. They do, however, confirm earlier reports—e.g., Stengel (1952).

In view of these three findings—the small number of suicides in mental hospitals; the very large number of unsuccessful suicide attempts arising from illnesses that are subsequently treated successfully in mental hospitals; and the small proportion (13%), among actual suicides, of persons previously treated in a mental hospital—it

seems safe to conclude that admission does exercise the important preventive effect expected of it.

PATIENTS' COÖPERATION

The prospect for further prevention would be dim indeed if potential suicides were all of temperament so independent that all refused outside help. There are three main forms of evidence—personal, medical, and social—with which to answer this question.

Personality : Evidence from Physique

As mentioned above, somatometric data are available about patients attempting suicide. There is already evidence that men of lean and muscular build are more disposed to suicide. These findings we hope to report in greater detail when samples become large enough to permit further analysis by age. It already seems clear, however, that much overlap exists between the distribution of physical types found among healthy men, men who only contemplate suicide, men who attempt it, and those who succeed ; further, the correlations between physique and temperament are unlikely to be so high as to exclude all hope of persuading potential suicides to enter hospital when the need arises.

Stengel (1952) suggested that the two groups of people attempting and committing suicide formed two different populations. These views derived partly from the assumption that suicidal intent was greater when single-minded than when characterised, as it is in so many unsuccessful attempts, by a special appeal to individuals or to society for attention. But Stengel also recognised the strong tendency for the two groups to overlap.

Clinical Evidence

This has been collected from clinical examination by one of us (I. S.) and from an analysis of notes of patients

TABLE I—FREQUENCY OF DEPRESSION AND OTHER DIAGNOSES AMONG PATIENTS ATTEMPTING SUICIDE

—	Number	Dominant mood change		Disorder of thinking —e.g., schizophrenia	Other disorders (psychopathy, hysteria, &c.)
		Depression	Anxiety		
Men :					
Suicide attempt (reason for admission) ..	39	28	1	3	7
Previous attempt (not recent) ..	12	9	0	2	1
Total ..	51	37	1	5	8
Women :					
Suicide attempt (reason for admission) ..	47	37	4	1	5
Previous attempt (not recent) ..	33	22	1	3	7
Total ..	80	59	5	4	12

who have attempted suicide to show the frequency of depression and other diagnoses (see table I). As is well known, patients with affective disorders, such as anxiety and depression, are more likely to coöperate than those with thought disorder or psychopathic behaviour.

Depression was diagnosed in 72·5% of men and 73·8% of women attempting suicide. It will be remembered that 57% of the coroners' series were stated to have been noticeably depressed or worried. Although psychiatric diagnoses and the statements of witnesses in court are not equivalent, it seems that those who attempt suicide and those who succeed at least share the description of being depressed. Dominant changes of mood, especially if anxiety states are included with depression, account for, or are at least associated with, the great majority of suicidal attempts. Abnormal, antisocial, and other psychopathic behaviour, without prominent change of mood or thought, was seen in 12 (14%) of 86 patients who had recently attempted suicide. Batchelor (1954) has suggested that such a diagnosis is appropriate in up to 25% of patients admitted to the observation wards of a general hospital after attempted suicide. Such cases,

TABLE II—FIRST ATTENDANCES FOR CONSULTANT PSYCHIATRIC ADVICE, FIRST ADMISSIONS TO HOSPITAL, AND ATTEMPTED AND ACTUAL SUICIDES AMONG OXFORD STUDENTS IN 1953–56

—	1953	1954	1955	1956
First attendances as outpatients at Park Hospital :				
Hilary term	11	26	22	24
Trinity term	17	18	18	21
Michaelmas term	10	29	19	22
Total	38	73	59	67
First admissions to Warneford Hospital :	10	20	12	19
Attempted suicide	4	4	0	2
Suicide	4	2	0	1*

* Oct. 13, 1956.

because of their frequent impulsiveness, may be harder to prevent, but even in general hospital experience they are not very common. From the preventive point of view the most significant fact in the present findings is the small number of patients showing disorders of thinking, the change so often regarded by the general public as a sine qua non for admission to a mental hospital.

Social Evidence

Parnell (1951) drew attention to the number of suicides among Oxford University students. By the end of 1953 there had been 15 suicides in seven years, an average of more than 2 a year. In the three years from July, 1953, to July, 1956, there were only 2 suicides—in men aged more than 33 working largely on their own for postgraduate degrees. Though no claim could be fully justified that comparative freedom from suicide among undergraduates in the past three years is due to social action, it is appropriate to recall that, from 1951 onwards, successive vice-chancellors took steps to awaken wider interest in this problem. The results are certainly not discouraging. It is reasonable to suppose that greater willingness by tutors and others in frequent contact with students to recognise the implications of an alteration in mood or behaviour and to seek early advice from a college doctor may be partly responsible for whatever improvement has taken place. It must be admitted, however, that the continuance of suicides of students elsewhere raises some doubts. The incidence of mental ill health in general among students remains little changed and is summarised for the past four years in table II. Because undergraduates are free to seek advice wherever they choose, and may do so in London or elsewhere during the vacation as well as at other hospitals in Oxford, the figures should be regarded as minimal.

With an average of 5951 male students in residence in 1952–56, the minimal annual first-admission rate to mental hospital is roughly 25 per 10,000. For the general population of similar age the figure was 11 per 10,000 in 1951, but this included a small proportion of readmissions. For students, therefore, not only is the admission-rate high but also the total rate may be higher, and the figures provided for comparison with other young men underestimate the difference.

The following extracts from statements of witnesses at inquests emphasise both warning signs and social attitudes:

Change of mood:

"He was very depressed, which was something quite new."

"He was a cheerful man until the last fortnight but became very depressed. He had had a previous breakdown."

"He had been unwell for years, but for a few months before his death had been very depressed."

Possible delay in obtaining advice:

"He had been in abnormally good spirits six months ago but since then depressed and unable to concentrate. On the night before he died we were discussing him and agreed it was desirable he should see his family doctor or a psychologist."

Moral attitude of witnesses:

"He told me about his previous attempt at suicide, and I said he must snap out of that frame of mind; the best he could do was to stick it."

"He said he had been very depressed and that it had taken the form of a very strong temptation to commit suicide. He had been quite *normal* in conversation."

The last quotation illustrates the emphasis placed on so-called normal or logical thought as a reason for not seeking medical advice. Our evidence points to the primary importance of a change of mood; illnesses in which disordered thinking is prominent are comparatively seldom associated with suicide. Even here depression is likely to form part of the picture, as in the report: "He thought he had cancer (although the doctor told him he had not) and he had been ever so depressed." If the occasional patient is illogical, the logical one may be even more difficult to manage.

"Dr. X said that the patient was a logical man whom he would have been unwilling to certify as insane in order to obtain shock treatment." This particular patient had been adamant in refusing hospital care, but his wife thought she could have persuaded him. Persuasion, therefore, by all concerned is indicated.

Lastly, a common report: "He had never threatened to commit suicide." Direct questioning will often reveal otherwise concealed intentions. Sometimes direct questioning is avoided for fear of putting suicidal thoughts into a person's mind. This is a mistake. Once a patient has admitted that he feels depressed, frightened, or hopeless, leading questions about the depth of his depression can and should be asked. There is no evidence that such questions, put in a proper way, have any aggravating effect on the depression—rather the reverse, for confession often brings relief—or ever drive to suicide a patient who would not otherwise contemplate it. A rough guide is needed to the depth of depression. Does it cause the patient to weep without knowing why, or to feel that he wishes he could cry although unable to? Does he feel that life is not worth living? Has he thought of doing anything about it? If so, what? This is no time for hesitation in using all means of persuasion. To prevent suicide people should forget about logic as a sign of health and remember that many more lives are saved by getting depressed patients to hospital than by applying tourniquets for hæmorrhage or artificial respiration for drowning. Skottowe (1955) reported that nearly a third of his patients with depression had been ill for more than a year at the time of their admission to hospital. The frequency of depression in general practice has been well described by Watts (1956), who emphasises how often it is overlooked.

Choice of Method

Brooke (1956) has drawn attention to the increasing use of coal-gas poisoning and barbiturates during recent years. In the coroners' series of suicides here cited, 48% died from coal-gas, 9% from barbiturates, 6% from aspirin. There was evidence that barbiturates and aspirin were chosen more often by city dwellers, whereas more violent methods of shooting, hanging, and drowning were commoner in the rural area concerned. Obviously it is desirable to stop the public from obtaining lethal doses of dangerous medicines too easily, but the number of 391 suicides by barbiturates in England and Wales in 1954 is only a small proportion of the total. Since the choice of method is partly dictated by the means available, it is clear that effective prevention is more likely to depend on correct management of depressed people during the severe phase of their depression.

Conclusions

In a consecutive series of 100 suicides a majority (53%) had not received medical advice. Only 13 had been in a mental hospital in the year preceding death.

Warning signs were present in the majority. A change of mood, with depression prominent, was commonest. Previous attempts had been made by 11 suicides.

Evidence is presented that admission to a mental hospital has the preventive effect expected of it:

(1) The number of suicides in hospital is small.

(2) Large numbers of patients who have made unsuccessful attempts at suicide are subsequently treated successfully in mental hospitals.

(3) Only 20% of actual suicides had ever been treated in a mental hospital.

Analysis of hospital notes of patients attempting suicide shows the paramount importance of mood change and depression. Disorders of thinking are comparatively uncommon.

The high incidence of mental ill health among University students, judged by mental-hospital admission-rates, remains unchanged, but the number of suicides at Oxford University has dropped since widespread public and private discussions brought better recognition of this problem.

Newspaper reports indicate the need for a change in the attitude of the public. The dangers inherent in depression must be grasped more realistically, as well as the favourable outlook with treatment. That a patient does not threaten suicide, or again that he speaks logically, is no excuse for inaction. When depression is recognised, leading questions about suicidal thoughts are necessary to gauge the risk.

Choice of method for committing suicide is influenced by the means available. Control of drugs is important but less important than control of patients' depressions.

We wish to thank Mr. T. E. Gardiner and Dr. L. J. Timings, coroners for Oxford city and West Oxon respectively, who kindly sent us extracts from their records; Dr. R. W. Armstrong, Dr. W. Ogden, Dr. S. Last, Dr. R. G. McInnes, and the other psychiatrists who kindly permitted us to measure and interview patients under their care; and Dr. W. S. Maclay for the figure for suicides in mental hospitals. This work was undertaken during tenure by one of us (R. W. P.) of a grant from the Nuffield Foundation.

REFERENCES

Batchelor, I. R. C. (1954) *Brit. med. J.* i, 1342.
Brooke, E. M. (1956) *Lancet*, i, 150.
Fetterman, J. L., Victoroff, V. M., Horrocks, J., Bergman, E. B. (1951) *Amer. J. Psychiat.* **108**, 4.
Frost, I. (1956) *Lancet*, i, 963.
Huston, P. E., Locher, L. M. (1948) *Arch. Neurol. Psychiat., Chicago*, **60**, 37.
Maclay, W. S. (1953) *Proc. R. Soc. Med.* **46**, 13.
Parnell, R. W. (1951) *Lancet*, i, 731.
Registrar-General (1954) Statistical Review of England and Wales. H.M.S.O.
Sainsbury, P. (1955) Suicide in London. London.
Skottowe, I. (1955) *Practitioner*, **175**, 131.
Slater, E. (1951) *J. ment. Sci.* **97**, 567.
Stengel, E. (1952) *Proc. R. Soc. Med.* **45**, 613.
Watts, C. A. H. (1956) *Brit. med. J.* i, 1392.

Before Our Time

OLD MOORE AND HIS ALMANACK

A Tercentenary

In his FitzPatrick lectures of 1913 Charles Mercier gave a remarkably lucid account of the science and art of medical astrology. He traced its written history from about 4000 B.C. and emphasised its paramount importance to medical men down to at least the period of the Renaissance. He then referred to its decline and wrote: "Astrology is now utterly extinct. . . . It has been dead so long that it no longer stinks; perhaps because it is embalmed in the writings of so many men that were eminent in their day." If astrology was dead in 1913 it has certainly come to life again, witness the innumerable columns in the popular press devoted to "planning with the planets" or "what the stars foretell" and the enormous trade in "horoscopes." Quite recently, too, a London surgeon revealed that patients frequently ask him to operate on a day which they regard as propitious; and he very properly grasps this opportunity of sharing his responsibility with the stars. If any further evidence is required of the vitality of the ancient art of astrology it is provided by the number of Almanacks and Prognostications which continue to pour from the press. The most remarkable of these from the point of age is *Foulsham's Original Old Moore's Almanack*, which is the lineal descendant of an almanac compiled by Francis Moore in 1699 and which has apparently been issued without a break since 1701. The certified net sale of *Old Moore* at the present time exceeds one and a half million copies annually.

* * *

Francis Moore was born at Bridgnorth, Shropshire, on Jan. 29, 1657. He is said to have acted for some time as assistant to the notorious astrologer John Partridge (1644–1715). Having obtained a licence to practise physic—presumably one of the Bishop's Licences which constituted one of the few legal qualifications open to general practitioners at that time—he established himself in 1698 at the sign of "Dr. Lilly's Head" in Crown Court, near Cupid's Bridge, Lambeth, in the capacity of physician, astrologer, and schoolmaster. In 1702 he was living near the Old Barge House in the parish of Christchurch, Southwark, where he probably died between July, 1714, and July, 1715.

In 1699 appeared an almanac entitled *Kalendarium Ecclesiasticum*, by Francis Moore, Licensed Physician and Student in Astrology. This duodecimo of 48 pages contains a table of the Kings of England, the Law Terms, tide tables, astronomical data, and a list of fasts and feasts, in addition of course to the calendar. The prophecies are confined to the weather. The only sections of direct medical interest are the list of the Signs of the Zodiac with the parts of the body which they are said to influence, and short notes placed at the head of the calendar for each month. That for January reads:

"Let not blood this month unless necessity require it: Be careful of taking cold, for thereby Rheum and Flegm is much increased: Fast not long in the Morning, for it is hurtful: Use Meats moderately hot. Warm Cloaths, warm Diet, a good Fire and a Glass of Sack with a Toast is very seasonable, if you can get it."

The heading for March says:

"In this month advise with the Astrological Physician, for now Purging and Blooding is good, Blood and Humours increase, therefore now be sure use Meats of good Digestion, forbear salt Meats as much as possible, now good Drink is necessary; but above all, a good Breakfast, if you can get it, will do no harm."

The phrase "if you can get it" is often repeated, and it suggests that Moore, like most of his kind, rarely looked on the bright side of things. In his later almanacs, which give much greater space to prophecies, he illustrates one of the most constant characteristics of the early prognosticators—their almost entirely unrelieved gloom. Perhaps it was that plague, pestilence, famine, and sudden death were fairly safe things to foretell.

Moore's literary style, like that of many of his medical contemporaries, is by no means lacking in grace and vigour. His note for the month of May begins quite poetically:

"Now both Garden and Field afford Physick as well as Diet: Rise early, and walk abroad by the running Streams: Sage and sweet Butter is a cheap and wholesome Breakfast: Clarified Whey, with Sage, is also good, and so is Scurvy-grass Ale and Wormwood-Beer. Forget not to eat and drink betimes, you that have it."

With the last page of this little book we come to what was probably the main reason for its publication—an advertisement for Moore's wonderful pills:

ADVERTISEMENT

From Crown-Court, near Cupid's Bridge, in Lambeth-Parish, in Surry, Aug. 15, 1698.

Where is sold, by the Author, his Famous, Familiar, Family, Cathartick and Diuretick Purging Pill, very excellent for the Scurvy, Dropsie, French-Pox, and most other Distempers incident to the Body of Mankind: They work so gently, that you may take them at any time of the year; they hinder no Business. A Note of Direction will be given with each Box, which contains 40 Pills, for 2*s*. and the Half-box, containing 20 Pills, for 1*s*.

* * *

In July 1700 Moore completed a new almanac: *Vox Stellarum; being an Almanack for the Year of Human Redemption 1701.* This was dedicated to Sir Edward Acton, recorder and M.P. for Bridgnorth, Moore's native town. The general make-up is similar to that of its predecessor, but *Vox Stellarum* contains much more of medical interest. The twelve Signs and their dominion over man's body are now set out in verse, and each page of the calendar has a column of medical notes. Thus for January—

"Full Moon the 13th day at 1 afternoon will undoubtedly be made sensible of its Effects: They both cast an anxious Square to Venus, which threatens Females in general with stubborn Diseases, especially such as do proceed from Cold, which may turn to violent Fevers even at this time of the Year, and send some to the Shades, whilst others are swallow'd up in the Grave of despair; and an eminent Lady afflicted with much Sorrow, if not Death."

The last page again contains an advertisement:

"By the Author hereof (only) is sold his famous familiar Family Cathartick and Diuretick purging Pills.

The Author also thro' the Blessing of God, cures all sorts of Agues at once, whether Quotidian, Tertian or Quartan, tho' of long standing, and left off by others, as many now living can testifie, who have, by God's Blessing, been cured by him at last. This Distemper often comes by supernatural means, which is the reason it will not yield to natural means, nor be subject to the will of every Pretender; nor indeed many other Distempers besides. The Author also has an excellent Method and Medicine for the Epilepsia or Falling Sickness, and Convulsions in Children. He gives his Judgment *gratis* to all that come to him, and allows his Medicines at reasonable Rates. *Vivat Rex.*"

* * *

Francis Moore was not of course the first maker of almanacs. Almanacs, Kalendars, and Prognostications were among the earliest productions of the printing press and they have been issued in enormous numbers at all periods. The first Englishman to produce a printed Almanack and Prognostication was the famous Andrew Boorde in 1545. Moore himself had a host of rivals. The copy of the 1701 issue of his *Vox Stellarum* in the British Museum is bound up with 26 other almanacs for the same year. Among the more famous of Moore's immediate predecessors and contemporaries were his teacher John Partridge, William Lilly, William Audrews, John Gadbury, William Salmon, and George Parker. Almost all the early printed almanacs were the work of medical men. Some of the compilers were regular doctors of

physic, but the majority were, like Moore, "licensed physicians," or "students in astrology and physic"—the general practitioners of the day. These little books represent a prime source—as yet virtually untapped—for the study of the connection between astrology and medicine, for the history of certain aspects of medical practice and its regulation in this country, for the biography of many practitioners of great repute in their day, and for the history of medical advertising. Many of the early almanacs are exceedingly rare, only one or two copies, and these imperfect, having survived. Very few of the compilations that have appeared over a number of years exist in complete sets. In continuity, *Old Moore* is unrivalled, and its successive issues would provide a fascinating picture of the changes in popular medical beliefs and fashions over a period of more than two and a half centuries.

It may be noted that the present-day Old Moore does not offer any medical advice at first hand. His Almanack contains a great many advertisements for hair restorers, depilatories, rupture cures, slimming tablets, and oriental herbs of great potency. It also includes portraits of the Misses Marilyn Monroe and Dawn Addams, and a Pools Forecast for 1957. One is glad to see that the anniversaries recorded for January include the birthday of a former secretary of the British Medical Association; but oddly enough the nativity of the genuine, original Old Moore himself, on Jan. 29, 1657, is not mentioned.

W. J. BISHOP.

Public Health

B.C.G. Vaccination

IN his annual report for 1955, Dr. W. A. Horne, medical officer of health for Glasgow, refers to further extension of B.C.G. vaccination in the city. The total number of vaccinations performed again increased, and immunisation was extended to include further groups, notably Glasgow Police Force. During a period of seven weeks 118 schools were visited and some 12,000 children were tested, of whom over 8000 received vaccine. Two features of the campaign were notable—the striking increase (10%) in public response and the rise of almost 7% in the number of negative reactors, compared with 1954.

Almost 1300 members of the police force accepted the offer of B.C.G. vaccination, and the results of Mantoux-testing showed an unexpectedly high number of negative reactors, the over-all average being 13·4%. It was also surprising to find that negative reactors were distributed among all the ages tested, which ranged from 20 to 57. As a result of these findings, Mantoux-testing, followed by vaccination if indicated, has been made a requirement for entry to the Glasgow Police Force.

The London County Council has had made a three-minute coloured film entitled *B.C.G. Vaccination*, to be shown at local cinemas throughout the county during 1957. It encourages parents to allow their children to be tuberculin-tested, and vaccinated if the test is negative.

Births and Deaths in 1956

Provisional figures for England and Wales in 1956 have been issued by the Registrar-General.[1]

Live Births.—The birth-rate was 15·7 per 1000 population—the highest rate since 1950.

Infant Mortality.—The infant-mortality rate—23·8 per 1000 related live births—was the lowest annual rate ever recorded in this country. The rate was 24·9 in 1955, 25·4 in 1954, 26·8 in 1953, and 52·8 in 1938.

Deaths.—The death-rate was 11·7 per 1000 population. The rates for 1955 and 1954 were 11·7 and 11·3.

Stillbirths.—The stillbirth-rate was 23·0 per 1000 total live and still births. In 1955 the rate was 23·2 and in 1954 23·5.

1. Registrar-General's weekly return no. 2, 1957. H.M. Stationery Office. Pp. 20. 1s. 3d.

In England Now

A Running Commentary by Peripatetic Correspondents

WE have geologists the way some folks, as Thurber would say, have mice. Into a biological department they introduce large piles of crazy paving (the floor has had to be reinforced) and enormous wooden boxes. Not content with this, they telegraph us from remote areas "Have found dinosaur stop send packing case eight by six by four stop." We found one, by a fluke, but on that day the van was wanted for the agronomists' annual wayzgooze, and we had to despatch the thing to Waterloo on a handcart pushed by two junior technicians. All went well as far as Fleet Street. There a wheel came off. Fresh from an initiative test, the two juniors ditched the cart, removed the lid of the case, laid it on the inverted body, and finished the journey inside, like a panto horse, navigating blind and led by a policeman.

Only a few days later, another of the geological boxes produced a surprise. Its owner came in to see me with a vague expression on his studious face and a dirty block of apricot table jelly in his hand, divided up into squares, as such things are. "I want you to look at this" he said: "Do you think the same about it as I do?" It was wrapped in oiled brown paper. I smelt it, tasted it, put a piece in water, agreed with him that it was a half-pound chunk of blasting gelatin, and offered to take it up on the roof and destroy it. When he refused this unselfish offer (I suppose he thought it would go off and damage some of his lumps of rock) I told him to take it down the road and hand it in at the police-station.

Half an hour later he was back. "I gave it to the duty sergeant" he said: "the chap agreed that it wasn't a table jelly. He said he was going to put it down the toilet and pull the string, and he went and did."

So if a member of the Force becomes the first artificia satellite vehicle, I expect they'll blame that lot on Archbishop Makarios too.

* * *

An enforced rest in a small ward of one of our great hospitals has lately given me an opportunity denied to surgeons and their anæsthetists of observing preoperative treatment.

The operations on two young men aged about 11 were set for 4.30 P.M. When lunch passed them by they seemed sad. One confided to a passing porter that he would be glad when it was half past four.

"Why, are you going home then?"

"No, that's when I have my operation."

"Oh, you'll know nothing about that."

"I know, but it's the injection I don't like. . . I say, tell the staff nurse we're hungry."

This, of course, had no effect. But one of them soon found the remedy in the jar of sugar in his locker and consumed a fair quantity. This gave him the energy for preoperative physical exercise such as lifting the bed table up and down with his feet and playing ball with his neighbour. All this makes me, a mere physician, wonder how much anæsthetists really know about the preoperative stomach contents and blood-sugars of their patients.

* * *

Last week, in Boston, I gave four set talks, and also three little speeches on ward rounds. I am hoarse without emotion. But this is a great country for the medical visitor, for there is something he can be doing all the time in the way of meetings, panels, discussions, seminars, or even just drinking good coffee. They also manage to keep their students keen and interested throughout the course, instead of falling into exam-ridden apathy in the final year. Most of this is, I think, due to their large staff in proportion to patients and students—but it's not all logistics, there is also an attitude of mind (which I admire) which makes for uninhibited discussion by folk of all levels of seniority (and intellect). I'm not entirely enchanted, however. I keep in mind that I've only seen the best places, and also that the large staff and the attitude that it's all great fun may sometimes bear hardly on the patient, especially if he is coloured and perhaps a bit simple. I may be wrong about this—it may

be that the Americans are getting the medicine they deserve; they certainly pay enough for it. I'm amazed by the popular interest in health, and I guess that office doctors here have to read advance copies of *Time* and the *Reader's Digest*.

* * *

Luke is a dales farmer. A good one, but with a reputation for meanness and a capacity for getting anything that is going from the Government or Anybody Else. Recently he became a grandfather for the first time and was more than delighted with the arrival of twin grandsons. When I saw him on market day last week, I ventured to congratulate him on his new status and especially on the twins. "Aye," he said, "ain't it a grand thing. Straight into t' subsidy first time."

* * *

This week John came out in spots. Too much porridge, perhaps, his mother thought. "I am quite worn out with porridge," said John wearily.

* * *

Lord Osis disliked the Health Scheme because he could no longer annoy his doctor by owing him money. He had his blazonry inscribed upon his N.H.S. card and dispensed specimens of his urine in Veuve Cliquot bottles of a particularly brilliant year. He was a small sunburnt man with tufted hair, like an indignant coconut, and, as his message was late (as usual) and urgent (as always), I called on my way to the night train by which my chief was returning, and I, his locum Ananias, departing.

Lady Osis, large, rufous, and wrinkled like a Californian sequoia tree—which she further resembled by adding a ring for every year of her age, thus making her look as though she had been pebble-dashed with diamonds—broke trail along the landing to His Lordship's bedroom through the Osis fan-club of retainers, valets, grooms, secretaries, and dogs, which she trampled underfoot or ground unconcernedly against the wall.

"He's swelled up like a poisoned pup!" she bellowed, cheerfully unveiling her groaning and tympanitic spouse and suggesting almost unlikely cause for his distension. "Now if he was a cow," she added, presumably following the train of thought inspired by his dismal noises, "do you know what I should do?"

I didn't know, and still wish I still didn't know, but I adopted my best manger-side manner and examined the patient's abdomen by proceeding over it upon a Great Circle course. It was, I concluded, a case for masterly inactivity plus a good old-fashioned turpentine stupe.

"Turpentine?" shouted Lady Osis at my request, "Good God!" Are you going to paint pictures on it?" and made suggestions about selling advertising space, before issuing commands at the bedroom door. Long minutes passed, during which Lord O. retired under his bedclothes like Achilles sulking in his tent, his wife rent strips off a moth-infested horse-blanket, and I beat frenziedly with my dressing-case upon the hordes of dogs which were now surging about the room. A timid voice then informed us that there was no turpentine, and Her Ladyship erupted on to the crowded landing with the impact of a violently propelled cue-ball upon a snooker "pyramid." Bodies shot off in all directions into every orifice, and the noises of ill-usage of drawers and cupboards reverberated like the cannonading at Austerlitz.

When the barrage lifted I received a grimy cobwebby bottle with no label and an impacted cork. This, with several spiders, was removed by Lady Osis with a corkscrew she happened to be wearing. I sniffed the bottle; the smell was aromatic, but I couldn't identify it. Her Ladyship, however, brandishing her strips of horse-blanket in a blizzard of moths, cried, "Get to it, boy! I know turpentine when I see it!" and the stupe was lashed into place.

My nose twitched thoughtfully as I drove to the station, but not until I entered the newly decorated waiting-room was my olfactory problem solved. I told my chief through my carriage-window, "You'll find all the case-records in the car, and when you visit old Lord Osis, take along a blow-lamp. I've made his turpentine stupe with coach-varnish."

Letters to the Editor

TREATMENT OF SORE THROAT

SIR,—The paper by Captain Brumfitt and Captain Slater (Jan. 5) and the letter last week by Dr. Wheatley raise important principles on the use of antibiotics in general and in sore throats in particular.

My own interpretation of the two divergent points of view expressed is as follows: Brumfitt and Slater have shown that the place of antibiotics in the treatment of acute sore throat is still doubtful, both as regards which cases should be treated with these powerful drugs and as to whether the results are really very much different from those treated with non-specific measures. Wheatley on the other hand advocates that *all* cases of sore throat should be treated with *oral* penicillin in order to prevent complications related to streptococcal infections. He also states that it is the general practitioners whose views on the matter should be listened to. (But what, if not general practitioners, are the National Service medical officers?)

I feel that certain relevant points should be appreciated.

Ætiology.—What is the cause of the hundred-odd cases of acute sore throat that the average family doctor sees each year? The usual finding from throat-swabs is that only about half will grow any organisms that are usually recognised as pathogenic. In my own practice in the past 400 cases of sore throat in adults hæmolytic streptococci were grown from only 45%. What is the cause of the other 55% of cases? If these are not caused by specific organisms, then what is the rationale of using specific antibiotics?

Course.—Acute sore throat tends to clear up spontaneously and uneventfully after four or five days. If oral penicillin is to be advocated, then we should be shown that beyond doubt this shortens the illness.

Complications.—It is because of complications that the wholesale use of antibiotics is usually advocated. It is stated that their universal use has brought about the dramatic decline in the numbers of new cases of rheumatic fever and acute nephritis. But very probably the hæmolytic streptococcus was beginning to lose its virulence even before these specific drugs were being widely used. In my own practice I find that I am using penicillin in only 20–25% of cases of acute sore throat, the proportions being equal in streptococcal and non-streptococcal cases. In spite of these low proportions, in the past ten years I have had no cases of rheumatic fever and only 4 cases of acute nephritis; 2 of these were treated with parenteral penicillin, and the other 2 were so mild that they did not feel it necessary to consult me. Acute otitis media, mentioned in Dr. Wheatley's letter, is also a much milder disease, and in spite of using antibiotics in only 20% of cases I have had no acute mastoids or chronic running ears or permanent deafness in these ten years.

The advocation of the wholesale use of oral penicillin causes me considerable disquiet on two scores. First, its very ease of administration leads to possible abuse. Secondly, its absorption is doubtful in some cases, and we often find that our instructions are not followed by some patients who omit to take the preparation and still recover uneventfully. My own routine is to use only the intramuscular route and to give all the injections myself—the extra trouble to doctor and patient acts as a brake on facile use and abuse.

The time has surely come for us to reflect and review our habits in the use of antibiotics and to take into account the natural changes that have occurred in the common diseases for which they are so often given.

Beckenham, Kent. JOHN FRY.

SIR,—To me there seem to be three important points in Dr. Wheatley's letter

(1) The treatment of sore throat is *primarily the task of the general practitioner*. This is indisputable; but medicine depends for its advancement, not merely on intelligent observation, but on painstaking and controlled investigation, which the average practitioner, because he lacks either facilities, or—that more important commodity—time, is not in a position to undertake. Brumfitt and Slater are to be

commended for their perspicacity and initiative in seizing the golden opportunity of studying scientifically this common malady.

(2) *Penicillin lozenges*, not intramuscular penicillin, is the means of administration which the overworked practitioner must adopt. But if blood-borne penicillin cannot eradicate the streptococci lurking in the depths of the tonsillar crypts, what chance has the superficially acting penicillin lozenge?

(3) Dr. Wheatley attributes to antibiotic therapy the decreased incidence of local septic complications and toxic allergic sequelæ of sore throat. Yet I have treated 73 sore throats—some of them quite severe—without antibiotics and I have not had a single case of septic involvement of the middle-ear cleft; and has the reputedly high incidence of rheumatic fever and acute nephritis ever been conclusively proved to be higher than it is today?

Dr. Wheatley says nothing about the risk of inducing resistant strains of bacteria by indiscriminate use and inadequate dosage of the antibiotics. Nor does he mention the risk of sensitising the patient. He has, I think, been fortunate not to have met the nasty stomatitis which can develop during penicillin lozenge therapy.

I wish that Brumfitt and Slater had not been so hesitant in interpreting the obvious lesson of their inquiry, which has exposed the uselessness of routine penicillin for sore throat and which should lead to a further saving of this big gun for big occasions.

Royal Air Force,
Leconfield. A. R. SMITH.

SIR,—Dr. Wheatley suggests that information on the treatment of sore throat be sought from general practitioners. May I draw his attention to a recent report on the treatment of acute sore throat in general practice?[1] If Flying-Officer A. R. Smith (Jan. 19) reads this paper he may change his view that "nothing is to be gained by giving antibiotics or sulphonamides" in acute sore throat.

St. Mary Cray, Kent. E. TUCKMAN.

SIR,—In my opinion there is far too much tendency to prescribe sulphonamides, penicillin, or the broad-spectrum antibiotics for the ordinary follicular tonsillitis seen in general practice.

Tonsillitis being a simple infection of the upper respiratory tract, it follows that simple measures will suffice. I find that rest in bed for 3–4 days, combined with mist. acid. acetylsalicyl. *N.F.* and an abundance of bland fluids, will in the vast majority of cases be all that is required. It is important that a child should not return to school for at least another 4 days, and an adult for at least a week.

Of course, where there is any underlying condition, such as congenital or acquired heart-disease, or a past history of rheumatic fever, it is imperative that either a sulphonamide or parenteral penicillin be given.

Putney. BERNARD SWEETMAN.

THE Rh BLOOD-GROUPS

SIR,—Dr. Wiener's letter of Jan. 12 is full of confusion which suggests that he does not understand the CDE notation.

Dr. Nicholas last week showed how misleading Wiener's two tables are as presented. Had this been the only inconsistency it would not have been so bad, but there are other statements which may lead the unwary astray. Thus, Wiener says that anti-C and anti-D are less rational names than anti-rh′ and anti-Rh_0, and gives the following example: "corresponding to the gene symbol r'', Fisher and Race use the 'chromosome' symbol C^{w}deF, which includes the letters d and F for antigens for which no testing sera exist . . ." But d and F do not here stand for antigens but for genes, and should therefore have been in italics. The example is, therefore, irrelevant to the argument. One cannot maintain that a gene may not have a symbol simply because no testing sera are known. Therefore, one can only conclude that, in his mind, Wiener has confused symbols for genes with those of their products.

If Wiener really wants a logical nomenclature he should follow that given by Ford[1]; the most logical yet formulated.

Department of Zoology,
University of Liverpool. P. M. SHEPPARD.

BLOOD-GROUPS AND DISEASE

SIR,—Dr. Wiener's letter of Dec. 22 seems to call for some comment, although his bias against any idea of an association between blood-groups and disease (other than hæmolytic disease of the newborn) is well known. Far from being a waste of space, the publication of data, however fragmentary, concerning the genotypes of groups of patients, compared with those of satisfactory controls, is essential if progress is to be made in understanding the inherited basis of disease.

Instead of denigrating new work, most of which has been much more carefully controlled than that of thirty years ago, it would be more profitable for so eminent an authority on immunology (he is, after all, one of the discoverers of the Rh blood-groups) to try to integrate the following *facts*, which suggest that there may be immunological processes operative in peptic ulceration:

(1) That in six countries, the U.S.A. included, many authors have demonstrated a marked association between blood-group O and peptic ulcer. This is the most striking of several apparent associations between blood-groups and disease. It can hardly be due to chance that, of the many disorders studied, all the positive results concern diseases of the gastro-intestinal tract, carcinoma of the stomach, pernicious anæmia, and duodenal and gastric ulcer.

(2) That there is a strikingly higher proportion of non-secretors of the ABO blood-group antigens in duodenal-ulcer patients compared with general population controls. This association has also been shown to hold within families. The data also suggest, though they do not yet prove, that the association is greatest in those sibships which do not segregate for blood-group O.

(3) That within sibships the association between blood-group O and duodenal ulcer is not apparent though not disproved.[2]

(4) That drugs such as corticotrophin, cortisone, aspirin, and phenylbutazone, all of which cause or exacerbate peptic ulceration in man, also have an effect on antigen-antibody reactions and are frequently used in the treatment of hypersensitivity states.

(5) That many leguminous plants which form an important constituent of human diet contain ABO blood-group agglutinins; many of these will be neutralised in secretors but not in non-secretors (see accompanying letter by Cain).

The initial cause of mucosal damage in patients with peptic ulcer is quite unknown, and it seems to us that there is a good prima-facie case for investigating the possibility that immunological reactions play a part in the genesis of ulceration.

Heredity Clinic,
David Lewis Northern Hospital,
Liverpool. C. A. CLARKE
R. B. MCCONNELL
P. M. SHEPPARD.

POSSIBLE SIGNIFICANCE OF SECRETOR

SIR,—The widespread occurrence of the secretor/non-secretor polymorphism is now well established.[3] It is a stable polymorphism as defined by Ford.[4] This means

1. Chapple, P. A. L., Franklin, L. M., Paulett, J. D., Tuckman, E., Woodall, J. T., Tomlinson, A. J. H., McDonald, J. C. *Brit. med. J.* 1956, i, 705.

1. Ford, E. B. A uniform notation for the human blood-groups. *Heredity*, 1955, **9**, 135.
2. References relating to paragraphs 1, 2, and 3 are:
   Aird, I., Bentall, H. H., Mehigan, J. A., Fraser Roberts, J. A. *Brit. med. J.* 1954, ii, 315; Clarke, C. A., Wyn Edwards, J., Haddock, D. R. W., Howel-Evans, A. W., McConnell, R. B., Sheppard, P. M. *Ibid*, 1956, ii, 725; Anonymous, *Ibid*, p. 723.
3. Mourant, A. E. Distribution of the Human Blood Groups. Oxford, 1954.
4. Ford, E. B. *In* The New Systematics (edited by J. S. Huxley). Oxford 1940.

that (at least until extremely recently) it has been maintained by stabilising selection, which in turn implies that both secretors and non-secretors have some definite selective values. On the advantage of non-secretors it is useless to speculate until we know something positive about the condition, but one possible selective advantage of secretor can be suggested.

As Fisher [5] and others have shown, a selective advantage of as low as 0·5% can bring an allele to fixation in a population comparatively rapidly; and field studies [6–8] have shown that apparently very trivial characters, when properly investigated, may have startlingly high selection coefficients. Moreover the different effects of alleles can be profoundly altered by selective accumulation of modifiers.[9] Consequently, so well-marked a condition as secretor is exceedingly unlikely to be a mere by-product of some other important effect of the allele. It is far more likely to be there for a definite purpose.

The effect of secretor is to allow a considerable outpouring of antigens into the alimentary canal at its most anterior part. This suggests immediately that something is being taken in, as part of the food, which it is advantageous on the whole to neutralise as quickly as possible. This substance could be one that would damage the free cell surfaces of the epithelium actually lining the alimentary canal, especially those which are absorptive and therefore cannot be covered over with some impermeable protective substance.

The discovery that large quantities of blood-group agglutinins which can be neutralised by secretors [10] occur in the seeds of leguminous plants widely used for food goes far to support this hypothesis, and further suggests that these antibodies have a definite, if mild, deleterious action on some parts of the absorptive epithelium of the alimentary canal. Such an action, even if of little importance to civilised man, might of course be of considerable importance under the far more strenuous conditions under which man has lived for many thousands of years. The considerably lowered incidence of duodenal ulcer in secretors, as compared with non-secretors of the ABO blood-group antigens,[11] suggests very strongly the actual nature of this deleterious action.

The hypothesis proposed, therefore, is that ABO agglutinins deleterious to the absorptive epithelium of the alimentary canal, which are taken in as part of the food, are wholly or partially neutralised by secretors. This hypothesis has the advantage of being susceptible of experimental verification.

Department of Zoology and Comparative Anatomy, Oxford. A. J. CAIN.

A RAPID BLOOD-SUGAR SCREENING METHOD

SIR,—With the increasing interest in glucose enzyme tests and their application in urine examination, I should like to draw attention to a rapid blood-sugar screening test which is also based on the use of glucose enzyme test-strips. The method has been developed in this hospital. The difficulties encountered in trying to apply the enzyme test to quantitative estimations in urine are not met with to the same extent in blood, which is far less subject to variations in chemical composition and pH. In 500 experiments performed by independent observers in parallel with blood-sugar determinations by conventional biochemical methods, it was found that, within certain ranges, there is a definite and constant correlation between the blood-glucose level and the intensity of the colour developed on the strip.

The technique consists in placing a drop of blood from a finger or ear prick on the tip of a glucose enzyme strip, leaving it there for about fifteen seconds, and then washing the blood off under running water. The plasma soaks quickly into the filter-paper and the red blood-cells are washed off, permitting the reading of the result without interference from the colour of the blood. The colour developed is compared with an arbitrarily chosen three-tone colour scale. The whole procedure takes less than a minute and no reagents are necessary.

The test can indicate the following ranges of blood-sugar: very low; low; normal and slightly elevated; moderately elevated; and high. It does not require any particular experience and can easily be performed by any doctor. A full report is in preparation.

Queen Mary's Hospital, Roehampton, London, S.W.15. J. KOHN.

ANALGESIC DRUGS IN CHILDBIRTH

SIR,—I was very interested in the paper by Dr. Roberts and her colleagues last week and congratulate them on their investigation of an important and very difficult problem. The use of levallorphan to diminish the respiratory depression caused by the narcotic analgesics in childbirth is one of the most valuable potentialities of this antagonist. That its use did not result in a significantly improved minute volume in the infants may have been due to the fact that the dose of levallorphan was inadequate. I believe that a 1 : 100 ratio of levallorphan and pethidine [1] might have given more satisfactory results.

Manchester. MARK SWERDLOW.

UNMARRIED PARENTHOOD

SIR,—It must have struck other readers of Mr. Greenland's sensible paper last week on the ecology of unmarried mothers that it contained only one reference to the fact that pregnancy can be prevented by suitable measures. If in fact the "unmarried mother" differs from her sisters chiefly in being more fertile, if efficient contraception may "tend to reduce the number of illegitimate maternities among the higher-income groups," if unmarried mothers sometimes die of abortifacients and unmarried babies often die of neglect, the point is surely relevant.

I think that the trouble is that social agencies find themselves engaged in two distinct attempts—the prevention of unwanted pregnancy, and the attempted prevention of sexual behaviour in young people. Their merits apart, experience suggests that the first offers better chances of success than the second. "Moral welfare" has perhaps a real part to play in preventing married men from seducing unmarried women, and intelligent health and social education might inculcate a better idea of responsible sexual behaviour all round. Unfortunately the devotion of moral agencies to the prevention of coition has often eclipsed their anxiety over the tangible suffering unwise coition may cause. Some have regarded pregnancy as a desirable disincentive—few seem able to agree that, if they cannot prevent the initial step, it would be humane to limit its consequences.

Obviously the venue and personnel of unmarital relations are not promising for fully reliable contraception, and it may be that no contraception is "fully reliable." But I imagine a halving—if we got no more—only of the death-rate from abortion would gratify the devout as much as it would gratify me. Unfortunately, while it took Parliament about seven days, all told, to legislate against contraceptives in slot-machines, it has not implemented the recommendations of the Royal Commission on Population in seven years.

5. Fisher, R. A. Genetical Theory of Natural Selection. Oxford, 1930.
6. Cain, A. J., Sheppard, P. M. *Genetics*, 1954, **39**, 89.
7. Dobzhansky, Th. Genetics and the Origin of Species. New York, 1951.
8. Fisher, R. A. *Ann. Eugen.* 1939, **9**, 109.
9. Ford, E. B. *Advanc. Genet.* 1953, **5**, 43.
10. Boyd, W. C. Shapleigh, E. *Blood*, 1954, **9**, 1195.
11. Clarke, C. A., et al. *Brit. med. J.* 1956, ii, 725.

1. Swerdlow, M. *Anæsthesia* (in the press).

I certainly do not underrate either the value or the interest of the sociological approach to local differences. It might be well worth sending anthropologists to study the patterns of life which produce high outputs of illegitimate babies. A study of the economic causes which hinder marriage would also be interesting, and probably useful, especially in Peru. But while proper and general contraceptive education is no more an answer to a social problem than B.C.G. is an answer to tuberculosis, it seems an obvious first step: without it, as Mr. Greenland says, "children will continue to die needlessly, many of those who survive will be miserable, and the unmarried mother will suffer for our indulgences as well as her own."

Loughton, Essex. ALEX COMFORT.

SHORTAGE OF RADIOGRAPHERS

SIR,—As a radiographer, I would like to challenge several of the points raised by Dr. G. H. Illingworth (Jan. 5).

Firstly, he claims that only male radiographers are dissatisfied with their salaries. This is not the case. Both men and women feel strongly about the present low figures, and resent the Whitley Council's unrealistic attitude to our salary claim. Girls are beginning to realise more and more that there are plenty of jobs open to them with better remuneration and less exacting duties even in hospitals, let alone outside the N.H.S. Male radiographers are, of course, becoming extinct. There is absolutely no incentive to take up the profession, and there are strong inducements for those already in it to leave. In fact, they are leaving, in scores. Radiography will indeed be "a job for a girl" and will suffer in consequence.

Dr. Illingworth suggests that superintendents can largely be dispensed with. Yet the efficient administration of all but the smallest departments, with only 2 or 3 on the staff, would take far more time than the average radiologist would be willing or able to devote to it. Administration would inevitably devolve on the most senior of the radiographers, and she would soon find herself a superintendent in all but name.

In so far as educational standards are concerned, Dr. Illingworth himself defines just the type most desirable for X-ray work: "An intelligent girl of 17 or 18 with an aptitude for the work." We are surely not aiming too high in asking for a General Certificate of Education with a bias towards science subjects, to ensure filling the prescription, as it were.

As for the membership examination, which, incidentally, most students have no difficulty in passing in the two-year period, it is necessary to maintain our standard of knowledge at a reasonably high level, otherwise the quality of work will gradually suffer. There has been considerable exaggeration of the abstruse nature of the physics and apparatus construction taught. Only the fundamental parts and principles are dealt with, and any complexity is due to the diverse units and functions of a modern set. (Several hundred pounds worth of damage can be done to a tube through ignorance of its properties.)

I would like to register a strong objection to the implication in Dr. Illingworth's letter that the Society of Radiographers is deliberately making its membership examination too difficult, in order to limit entries and thus strengthen its hand. Under the all-powerful Whitley Council our own society seems to have very little to say, as the recent negotiations have proved.

Finally, a word about the training of staff. Surely the approved training-school, with its facilities for all types of special work, organised groups of lecturers, and so on, is the most efficient way of training personnel. Learning radiography started in a haphazard pick-it-up-as-you-go-along way, as with all new sciences, but a better system has been evolved over the years, and it would be retrogressive to return to learning in the department alone. In any case, it is becoming increasingly difficult for radiographers in the busy short-staffed departments of today to devote all the time they should to the practical training of their students sent down from the training-school.

X-Ray Department,
Royal Infirmary, Sheffield. N. ROBINSON.

SYRINGE CARRIER

SIR,—We doubt that the syringe carrier referred to by Dr. Lerman (Jan. 12) solves the problems of the anæsthetist.

In our view, the time-consuming labour is largely spent in cleaning, sharpening, lubricating, and assembling, all of which have to be done in any case, while saving is represented only by the time taken to insert the syringe in the container. Using the Nuffield type of aluminium container this would not be substantially greater, and Dr. Lerman is mistaken in thinking that these are expensive—they cost merely a few pence and can be damaged only by direct violence.

The multiple syringe carrier has three disadvantages. Firstly, by any one arrangement it must contain a fixed set of syringes, which may or may not accord with the demands of varying circumstances. Secondly, the contents are rendered potentially non-sterile on first opening, and subsequent openings add to the opportunities for contamination of all remaining syringes by air, droplets, or hands. Since the "life" of one boxful may be prolonged, this is no small risk. Thirdly, a syringe could be accidentally replaced in the box without necessarily giving any indication (e.g., by the presence of a broken seal) that it had been used.

We would expect cultures included in the box to be sterile after treatment by hot air or steam; but are more concerned at the results which might be obtained by placing a small plate of medium inside the box and examining it when the last syringe has been used.

Lewisham Hospital,
London, S.E.13. C. K. MCDONALD
J. PIRNIE.

ALLOXAN AND CARCINOMA OF THE LIVER

SIR,—In their stimulating preliminary communication (Jan. 12) Professor Gillman and his colleagues report that alloxan, given intravenously, seems to retard tumour growth without causing diabetes. If this finding is confirmed, it will be of great theoretical interest, for there may be a fundamental link between it and the important discovery made long ago by Warburg [1 2] that in cancer cells respiration is decreased and glycolysis increased.

Glycolysis proceeds at a lower oxidation-reduction potential (Eh) than aerobic carbohydrate metabolism (respiration). It would seem, therefore, that if a substance which raised the Eh of the tissues were introduced intravenously it might block the main pathway, glycolysis, from which cancer cells derive their free energy, and so cause retardation of growth or even necrosis. Alloxan has the potential properties of just such a substance.

Both ascorbic acid and glutathione, when injected intravenously, lower the Eh of the tissues.[3 4] This was first demonstrated by measuring changes in the decolorisation-times of oxidation-reduction dyes injected into the skin, and was confirmed by measuring directly the fall in the Eh of the tissues with an inserted electrode. In 1954 I suggested that the term "reductosis" might be introduced to describe this condition:

> "A disturbance resulting in a tendency towards a decrease in pH is called an acidosis, and one tending to an increase in pH, an alkalosis. It is possible that analogous tendencies towards changes in the Eh of the tissues may occur as the result of disease and the administration of drugs; tendencies towards increase or decrease in the Eh of the tissues might be labelled 'oxidosis' and 'reductosis' respectively, corresponding to a decrease or increase of available electrons."

Although ascorbic acid and glutathione undoubtedly, and cortisone and corticotrophin probably, cause a reductosis, no substance has yet been shown to cause an oxidosis. But alloxan and dehydroascorbic acid, which are found in Nature, might be expected to do so in

1. Warburg, O. *Pflüg. ges. Arch. Physiol.* 1913, **154**, 599.
2. Warburg, O. *Ibid*, 1914, **158**, 19, 189.
3. Loxton, G. E., Le Vay, D. *Nature, Lond.* 1953, **171**, 524.
4. Loxton, G. E., Le Vay, D. *J. Pharm. Lond.* 1954, **6**, 178.

massive intravenous doses. If in fact they do, they might also be expected to retard tumour growth, by direct action on cancer cells rather than through the intermediary of the endocrine system.

There are three interesting questions:

1. Does alloxan, in the doses given by Professor Gillman, cause a measurable oxidosis, and if so for how long?
2. Does dehydroascorbic acid given in similar doses also retard tumour growth, and does it cause an oxidosis?
3. If alloxan acts in the way I have suggested, then by analogy with the reductosis caused by the intravenous injection of ascorbic acid and glutathione one would expect the effect to last for only about an hour. Is the retardation of tumour growth enhanced by repeated administration?

London, W.1. G. E. LOXTON.

HEAD INJURIES

SIR,—Mr. Lowden (Jan. 12) asks for guidance in the selection of cases requiring neurosurgical management. May I suggest that he solicit advice from the nearest neurosurgical consultant by telephone? Initially because of a paucity of neurosurgical beds in Bristol, we instituted a system of "vetting" by a consultant, or perhaps a senior registrar, of all cases referred for admission to the neurosurgical unit. Judged by the results, the system has worked well in the interests of the patients.

It may be asked, can a case of head injury be provisionally assessed on the telephone? It certainly can, as experience shows. This stems from the fact that diagnosis is based on signs which can reliably be described: state of consciousness, pupils, reflexes, and so on, and particularly the chart readings, of which pulse and respiration rates are the most important. We have encouraged the practice of fifteen-minute readings for the first two hours, then half-hourly, then hourly, so that the trend of the case may be the more quickly judged, especially if a verbal consultation may have to be sought. Where possible the patient should be brought to the neurosurgical "base"—not so much for operation as for observation if diagnosis is in doubt, and so that he can be seen frequently, if need be, by the specialist surgeon in the tricky postoperative days. The surgeon may have to see his ill patient several times a day. Secondary operations are not uncommonly required and often with very short warning.

The practice of obtaining expert advice should eliminate the risk of a death in the ambulance. Concerning casualty departments and cases of head injury, a safe rule was in force in my former medical school—admit everyone with a history of unconsciousness, even if very brief. The beds were found, despite very large waiting lists.

Frenchay Hospital, Bristol. G. L. ALEXANDER Neurosurgeon.

THE RELATION BETWEEN SMALLPOX VACCINATION AND POLIOMYELITIS

SIR,—Dr. MacIver[1] found that of 35 cases of poliomyelitis in children aged $3\frac{1}{2}$ years or less, only 2 showed evidence of vaccination in infancy. He emphasised that written records can be fallible and that all these children had been examined for an actual vaccination scar. Our own survey,[2] which showed 29 vaccinated children among 54 under 5 years who had had paralytic poliomyelitis, was a "backward investigation" covering the years 1951–55. It was based on the records, because we could not get visual evidence in a number of the children who had left the area since their illness. But in view of Dr. MacIver's emphasis on the importance of evidence of a scar, those children in our survey who are still available in the area have been examined. Of the original 29 vaccinated poliomyelitis cases and 23 vaccinated controls, 19 cases and 17 controls were seen. Vaccination scars were confirmed in 18 cases and in 17 controls. In only 1 case was there no definite visible evidence of vaccination.

While we did not claim that the results of our survey were statistically significant, the check against visible evidence supports the original findings. It is also satisfactory that within this admittedly small field of inquiry the accuracy of the written records is sustained.

During 1956 there have been few cases of paralytic poliomyelitis in this division. Of the 8 cases among children below school-age, inspection of the arm shows that vaccination had been successful in 5. This additional evidence supports our previous view and does not confirm Dr. MacIver's findings; but we hope nevertheless that he will continue to keep records of the vaccinal state of children who contract poliomyelitis and will also compare them with suitably selected controls.

Since we last wrote, we have seen the results of an investigation undertaken in Vienna by Dr. F. Puntigam and Dr. K. Berger.[3] Examination of the records of 121 children aged 1–4 years who suffered from poliomyelitis between 1951 and 1955 showed that in Vienna (as in South-East London) there was no statistically significant difference in the incidence of the disease among vaccinated and unvaccinated children.

Divisional Health Office, 29, Peckham Road, S.E.5. H. D. CHALKE F. L. CLARK.

CARDIAC ARREST

SIR,—By his Hunterian lecture in January, 1956, Mr. B. B. Milstein has contributed greatly to the problem of the management of cardiac arrest, and his letter (Jan. 5) shows that he considers that every physician and surgeon, and presumably, therefore, every registrar and houseman, should be prepared to undertake open cardiac massage when faced with such a catastrophe. A few comments from one who, in the past, has had some considerable experience of this complication, in surgery other than thoracic, may not be out of place.

In 1926 I became resident surgical officer of the General Hospital, Birmingham, and six months after my appointment a new Coroner's Act became law, one clause of which permitted the surgeon, in the event of an inquest into the cause of a death under anæsthesia, to be represented by the resident surgical officer, provided the latter was present at the operation, instead of, as hitherto, having himself to appear in court. The result was that, as soon as there was an impending disaster in any operating-theatre, I was hastily summoned in order that I should be present in case the worst should happen.

This was in the days when anæsthesia was very different from the skilful affair it is today—mainly "rag and bottle," no intratracheal tube methods, very primitive gas-and-oxygen apparatus, and almost no understanding of modern methods of general preparation of patients for operation. During my three years as resident surgical officer, I saw 30 cases of cardiac arrest. At first, I used the methods of management current in the late '20s, when open cardiac massage was generally regarded as the most dramatic and very last thing to be done.

At about this time, Dr. W. B. Primrose, wrote a paper[4] stating that, unless the heart could be started within three minutes, irreversible changes would develop in the central nervous system, and this is just what my own short experience had shown. So far as I am aware, this was the first paper to bring to the notice of surgeons and anæsthetists the significance of this absolutely fundamental time-factor, and it had an immediate effect on those most likely to be involved on these occasions. From then on, we set about direct heart massage as soon as the anæsthetic had been withdrawn and a clear air-way assured.

However, in those days there were no thoracic surgeons, and certainly no heart surgeons: it was the general surgeon who faced these crises, most often in abdominal cases but by no means always so. It was not unnatural, therefore, that the popular route for direct cardiac massage was through the under-surface of the left diaphragm. If not already open the abdomen was rapidly entered through an upper left mid-

1. MacIver, D. *Lancet*, 1956, ii, 683.
2. Chalke, H. D., Clark, F. L. *Ibid*, p. 545.
3. Puntigam, F., Berger, K. *Wien. klin. Wschr.* 1956, **106**, 412.
4. *Brit. med. J.* 1935, ii, 540.

rectus incision. A further incision, through the left half of the central tendon of the diaphragm into the pericardial cavity, was then made with a knife held with the forefinger along the back of the point, and the thumb and middle finger protecting all but the terminal half-inch of the cutting edge. The first two fingers were then slipped into the pericardium and around the heart, which was massaged between them and the thumb (which remained below the diaphragm) at a rate of about 60 per minute. In 6 of the above 30 cases the heart was re-started by this technique and the patients made a complete recovery. Of the remainder, in well over half the heart was re-started but the patients did not survive, either because spontaneous respiration was not established, or because the heart stopped again and could not be re-started, or because, although spontaneous respiration did start, changes in the central nervous system developed and the patient failed to recover consciousness and died within seventy-two hours in spinal rigidity and hyperthermia. I can vouch for the fact that the heart had indeed stopped in all 30 cases. In those days we had not learned to differentiate between "cardiac arrest" and "ventricular fibrillation"; but I can recall how on occasions, when I first put my fingers on the left ventricle, there was a sense of vibration, like touching the neck of a purring cat, presumably due to fibrillation, whilst on other occasions, I gained the impression of a completely inert bag. After three or four firm compressions a spontaneous "kick" could be felt, and with a few more compressions regular beating would continue. When the heart was slow in starting to beat, or failed altogether to start beating, firm regular massage by this route produced a palpable pulse at the wrist and in the carotids, and therefore an adequate cerebral circulation.

I had occasion to massage the heart twice during Army days in the late war; one patient recovered, but the other died as a "spinal animal." Since then I have had to apply massage in 2 further cases; neither patient recovered, though on both occasions spontaneous action of heart and respiration were restored.

Nowadays, with modern ancillary services, and especially with good anæsthesia, the general surgeon encounters these occasions less commonly than does the thoracic surgeon; and the latter, having the chest open, will naturally apply massage directly. Since surgery of the heart has been developed, it would seem that ventricular fibrillation has become much commoner. The heart in arrest can be re-started by massage; the heart in ventricular fibrillation is much more difficult to resuscitate, and often requires electrical defibrillation. It is fibrillation, it seems to me, that makes the difference between the thoracic and abdominal approaches, since the defibrillator pads cannot be applied through the diaphragm. Because "arrest" and "fibrillation" cannot be differentiated until the heart is exposed to sight or touch, I think general surgeons must persuade themselves that the thoracic approach is preferable—though admit that, were I faced with the need during an abdominal operation, I should proceed from below.

One final remark: although Mr. Milstein's letter suggests that the technique of thoracotomy for cardiac massage can be mastered by all, the question does arise—how junior a resident might be expected to undertake this procedure if no more senior person happened to be available? I think it depends on his experience; should he be serving on a thoracic firm, or have seen cardiac massage performed previously, he would obviously be in a better position to try to rescue the situation. Yet I do not consider that a man should be blamed for not making the attempt if by temperament or lack of experience he does not feel competent to do so. The question is important from another point of view; occasions have happened when, in a coroner's court subsequently, a pathologist has expressed the opinion that such an attempt by a relatively young man should not have been made. I regard this as a most unfair criticism for anyone to make who himself is never likely to be faced with such a crisis.

University Department of Surgery,
Queen Elizabeth Hospital,
Birmingham, 15. F. A. R. STAMMERS.

FLUORIDATION: A MISQUOTATION

SIR,—In a pamphlet from California entitled "Fluoridation Unmasked" the following statement about myself appears:

> "Professor R. A. Peters, Biochemist of Oxford, England, says: 'Fluoroacetic acid prevents the body from breaking down the citric acid created when sugar is burned into simpler compounds. Retention of waste citric acid acts as a violent poison on heart and nervous system. Fluoroacetic acid is used by African natives to murder their enemies. What will happen to the person drinking fluoridated water when he uses vinegar?' (acetic acid)."

I do not know upon what writing of mine this is supposed to be based, but I think it as well to point out that it gives entirely the wrong impression. Inorganic fluoride acts completely differently in the body from fluoroacetic acid, in which the carbon is linked firmly to the fluorine. Fluoroacetic acid is a rat poison which is much more toxic than fluoride. The suggestion in the last sentence that fluoride and acetic acid will combine easily to form fluoroacetic acid is very wide of the truth. It is in fact quite difficult to synthesise fluoroacetic acid, and certainly there is no evidence that it can happen in the body; furthermore, acetic acid (vinegar), if given early enough, is an antidote to fluoroacetic acid poisoning in some animals.

A.R.C. Institute of Animal Physiology,
(Biochemistry Department)
Babraham, Cambridge. R. A. PETERS.

PROLONGED PYREXIA IN CHILDREN

SIR,—The answer to Dr. F. E. James's problem (Jan. 19) is probably brucellosis, despite his careful investigation. He has apparently ruled this diagnosis out because the outbreak appeared more like an upper respiratory infection, and because in one case the agglutinations were negative. The first reason is not an adequate one. Brucellosis often presents as prolonged "influenza," which does not respond to sulphonamides or penicillin. A good example of a similar outbreak was given by Elkington et al.,[1] and I have seen a minor epidemic near here.

The negative agglutination has been the downfall of many a physician, and it cannot be too often or too strongly emphasised that a negative agglutination test does not rule out brucellosis. Harris[2] goes so far as to say: "In the chronic phase of brucellosis the finding of a positive blood-agglutination reaction in a significant titer is the exception rather than the rule."

Apart from this, the histories are suggestive: the continued low-grade pyrexia, the lymph-glands in the posterior triangle, and the reference to tiredness and lack of energy. Without any prior knowledge, I venture to guess that the milk-supply at the time was raw (possibly from tuberculin-tested herds, but not pasteurised), and that among the people who drank it there were several with prolonged fever, headaches, constipation, lassitude, irritability, and perhaps later rheumatic or neurological symptoms. It may be too late to detect the organisms in the milk, but a diagnosis could be made in the patients even now. The next step is a brucellin skin test, which is similar to the Mantoux test. If it is positive, it shows that the patient has at some time been infected with brucella. It has, however, a higher proportion of negative results than the Mantoux. After that, the agglutinations should be repeated to see if there is a rise in titre or a change from negative to positive. This rise may take place about the second week after the skin test, or it may be delayed for four or five weeks. It is possible that a more reliable answer may be obtained

1. Elkington, G. W., Wilson, G. S., Taylor, J., Fulton, F. *Brit. med. J.* 1940, i, 477.
2. Harris, H. J., Stevenson, B. L. Brucellosis (Undulant Fever): Clinical and Subclinical. New York, 1950; p. 282.

if search is made for blocking antibodies and Coombs antibodies (Bürki and Fey [3]).

Bath. HUGH WALLIS.

REFLUX ŒSOPHAGITIS

SIR,—Your leader last week is full of interest. We note with regret, however, that of thirteen references to the literature all but one are American and that you have omitted articles which appeared in your own journal on this subject over our two names in 1955 and 1956.[4]

In these two communications we recognise a point to which your leader refers—namely, the importance of digestive juices other than gastric in the production of œsophagitis. We also suggested a method (Roux-en-Y) of avoiding this sequel to operation.

In the operation we described, the rapid emptying of gastric remnant is essential to success, and we should like to take this opportunity of drawing attention to the fact that we now make an antecolic gastrojejunal anastomosis. Previously we drew the jejunum through the mesocolon, but we have reason to believe that this may cause some obstruction. The more anterior arrangement lies comfortably. Passage of the jejunum through the mesocolon near the splenic flexure seems very liable to be followed by a certain amount of fat-necrosis, which may prove very troublesome. We intend to make this the substance of a further communication.

Department of Surgery, University of Liverpool. CHARLES WELLS.
Alder Hey Hospital, Liverpool. J. H. JOHNSTON.

THE FUTURE OF NURSING

SIR,—May I as a nurse ask your readers not to regard either the tone of Miss Margaret Lamb's letter last week or certain statements in it as characteristic of the outlook of the nursing profession?

The last paragraph, which suggests (if I follow its meaning) that the standards and code of ethics of nurses have nothing to do with and are not the concern of the medical profession, seems to me to call for a disclaimer on our part.

As I, and I hope many other nurses, see it, the trained nurse acts in a dual capacity. First, she assists the doctor by carrying out the treatment he requires for his patients (using the word "treatment" in the widest possible sense), and by giving him the results of her expert observation of his patients, since her contact with them is much less intermittent than his. Secondly, she uses in the service of the patients her own skills, which include much not normally the concern of the doctor—important details of basic nursing care, and the maintenance of a therapeutic environment (which should include such amenities as quiet, order, fresh air, and flowers or other pleasant things to look at); and, if she acts in a senior capacity, she should be the twenty-four-hourly coördinator of the now almost innumerable services provided for the patient—from catering to religious ministrations, from pathological-specimen-taking to visitors, from physiotherapy to floor-polishing, from voluntary helpers to social surveyors. In domiciliary nursing the nature of the duties may be different, but the need for coördination is no less great. Without this coördination the patient is liable to be exposed to chaos. The nurse cannot secure it unless she is wise enough and tolerant enough to realise that all have a common aim, to show that she respects the contribution of all who serve the patient, and to keep herself free from the professionalism-run-riot which so easily infects certain groups.

The nurses' high privilege of being the only ones on whom the patient depends for constant care all round the clock should make it easy for them to accept that it is ultimately the doctor who is in charge of the patient.

Although the ward sister, for instance, has lines of responsibility directly to her medical staff and another to her matron as professional head of the nursing service, the fact that conflict between these responsibilities is so remarkably rare suggests a true partnership, in which the nursing profession willingly assists the medical profession, but both make also their individual contribution to the well-being of the patients.

This could not but suffer if nursing became an entirely independent profession with differing standards and ethics, and a training in which doctors take no part. One can only suppose that those who put forward such suggestions have not fully thought out the implications.

King Edward's Hospital Fund for London, Division of Nursing, 21, Cavendish Square, W.1. MURIEL M. EDWARDS.

SIR,—As a nurse who has for the past thirty years been actively concerned with the training of nurses, may I try to sum up the situation which concerns many at the present time? As I see it, we require three groups in the nursing profession:

(1) A small group, highly trained and with great ability, to plan future progress, to negotiate with the appropriate Whitley Council, and to represent the profession at Ministerial level and on important bodies when nursing opinion should be expressed. It is for the benefit of members of this group that some advocate the institution of a university degree in nursing. While the value of this is debatable, none will deny that a "trained mind" is of great importance in those who aspire to lead their profession.

(2) A large body of nurses who are capable of fulfilling all the needs of the sick—a far wider requirement than bedside nursing care, important although this is—who can give intelligent assistance to their medical colleagues, who are wise in handling and capable of teaching student nurses, and who by word and example can guide the public on matters of health and hygiene.

We expect much of our nurses, and our methods of training in the past have met with some measure of success, if we may judge by the regard of patients, and by the esteem in which British-trained nurses are held in many countries overseas.

That the training needs constant consideration, and frequent modification to meet changing conditions, is fully realised by the General Nursing Council, which includes medical and educational representatives, but reorganisation must be undertaken with great care, lest a retrograde step causes the loss of much of the progress made during the past century.

(3) There is unquestionably need to give every opportunity to many who for various reasons are unable to meet the full demands of training for State registration, and yet have real gifts of nursing. Assistant-nurse training is still in its infancy, and both nurses and doctors can do much to overcome the ignorance which at present delays the full acceptance of this grade as an essential and invaluable part of the nursing service.

Strong representation has long since been made to the appropriate Whitley Council, both to give equal consideration to those engaged in assistant-nurse and in State-registration training, and also to approve a grade of "senior" assistant nurse. Early recognition of these principles would help considerably to give the assistant nurse a full and honoured place in the health team.

With such varied requirements, and faced with candidates of widely differing ability, it is hard to envisage one basic training likely to give equal opportunity and satisfaction to all; and, although theoretically such a scheme has much to commend it, in practice we might well lose many of the very students whom we are most anxious to attract.

For the present I would choose rather to see a more careful selection of students, with guidance of each individual into the type of training likely to give the fullest satisfaction and benefit to all concerned.

3. Bürki, F., Fey, H. *Schweiz. Z. allg. Path.* 1953, **16**, 945.
4. *Lancet*, 1955, **i**, 937; *Ibid*, 1956, **ii**, 479.

Finally may I reaffirm my view that 18 years is the minimum age at which the average student should be expected to face the physical, mental, and spiritual strain which training in a general hospital imposes, and which can perhaps only be fully understood by those who have taken such training; also that the State-registered nurse, after three years' training, is still very young at 21 to accept the heavy responsibility which qualification brings.

The conflicting requirements of the sick patient and of the student nurse present perhaps the greatest problem with which the nursing profession is faced at the present time; and this emphasises the need to encourage the appropriate training and full use of all who can participate in this essential service.

Addenbrooke's Hospital,
Cambridge. L. J. OTTLEY.

RECURRENT MOTOR PARALYSIS

SIR,—The following case appears to us to be unique:

A girl, aged 6 years, was first seen by one of us (G. E. B.) at St. John's Hospital, Uxbridge, on March 23, 1956. She had been sent in as a case of poliomyelitis because she was "dropping things" and her arms and hands were weak. There was an indefinite history of frontal headache and pains in the elbows during the previous weeks but no fever or meningism. On admission she had hypotonia of both arms with bilateral weakness of the shoulder-girdle, triceps, biceps, and extensors of the wrists. No sensory changes were detectable. Lumbar puncture yielded a normal fluid; a blood-count was normal, as also was the serum-potassium. There was no porphyrinuria.

The child made steady progress and on April 25 was discharged home; but, as there was some residual weakness of the right deltoid and the extensors of both wrists, she was to attend a nearby hospital for physiotherapy. Eight days later, on May 3, she was admitted to this hospital as an acute respiratory emergency. This time she was moderately febrile. There was complete diaphragmatic paralysis, with weakness of swallowing and of the voice and hemiparesis of the soft palate (left) and of the tongue (left). There was also right facial paralysis and generalised weakness of all four limbs. On admission her vital capacity was only 400 c.cm. As this decreased to 300 c.cm. within an hour, tracheotomy was performed and a cuffed endotracheal tube was inserted as a preliminary to intermittent positive-pressure ventilation. The improvement which resulted from these procedures, however, was such that her intercostals supplied her needs and she was not in fact mechanically ventilated. Intragastric feeding had of course to be instituted. Subsequent progress was slow but steady. On May 22 the tracheotomy tube was removed and by May 25 she was swallowing satisfactorily, her voice had become much stronger, and her vital capacity had increased to 800 c.cm. Power was also returning to her limbs and she was allowed up.

On June 19, however, the right facial palsy, which had fully recovered, recurred, and fears were entertained that a further bout of paralysis might ensue. Fortunately, these were not realised and by July 2 her vital capacity had increased to 1040 c.cm. although her cough was still poor.

By July 17 she was walking well and the right facial palsy had, for the second time, almost recovered. There was still, however, poor dorsiflexion of the wrists and a tendency to bilateral dropped foot. Her tendon reflexes were just present and equal in all four limbs. No sensory disturbance was demonstrable at this—or any other—time apart from some slight loss of vibration sense at the left external malleolus. She was accordingly discharged home on July 17 and asked to return periodically for observation.

She remained well at home until July 28 when she complained of pains in her legs and her walk became unsteady. A week later the rash of chickenpox (to which she had been exposed by her cousin) appeared, and simultaneously a marked weakness of the left side of the face was seen. Readmitted on Aug. 4, she had no other cranial-nerve palsy. Chest movements were good and the diaphragm was acting normally, although her cough was still not very forcible. Her limbs appeared to be much as they had been on discharge, although, while the upper-arm tendon reflexes were just present, the knee and ankle jerks were absent on both sides. The abdominal reflexes were present, and there was again no sensory loss.

The facial paralysis persisted for some days and then recovered rapidly. Repeated investigations at this stage showed normal fundi, a normal cerebrospinal fluid, normal serum-potassium, and absence of porphyrinuria. The serum gamma-globulin and pyruvate levels were also normal. Progress was rapid, and dorsiflexion of the wrists became strong at last though there was still slight bilateral dropped foot. She was discharged on Sept. 8, since when she has been seen several times. She is in good health, intelligent, lively, and cheerful with very slight residual weakness of the left side of the face and of the limbs.

Here then is a child who, within five months, sustained four separate episodes of motor paralysis involving (1) both upper limbs; (2) the diaphragm, the pharynx, the larynx, the left tongue, the left side of the palate, and the right face; (3) the right face; and (4) the left face. To what can these recurrent palsies have been due? It seems very unlikely to have been an infective agent. To begin with, fever was absent during the first episode and only slight at the onset of the second, was absent during the third, and during the fourth was due primarily to the chickenpox. There was no meningism at any time; the cerebrospinal fluid was normal throughout, as also was the blood-count. Again, in view of the normal gamma-globulin, it is hardly conceivable that, after such a severe challenge to the defences as was sustained in the second episode, antibodies would not have appeared in sufficient titre to ensure immunity for months, if not for years.

The alternative is an error of metabolism (analogous, perhaps, to migraine) producing some toxin or deficiency with a selective action on the lower motor neurones. Efforts were made to discover whether any particular drug or article of diet could have been responsible. When the right facial palsy recurred on June 19, she was still in hospital under observation and close inquiry into all conceivably relevant factors was made. The only suggestive fact was that, a few days previously, she had been given phenolphthalein as a purgative—at her mother's suggestion, because she had been accustomed to it at home. The mother was advised that this had better be avoided and she was not given it again. As the final episode of facial palsy coincided with the onset of chickenpox, it is tempting to connect the two; but there was no evidence of encephalitis or of geniculate herpes—the only ways, in our experience, in which the varicella-zoster virus affects the facial nerve.

We should be interested to know if any of your readers has encountered a similar case. Moreover, as the patient returns for periodic observation, we would welcome suggestions as to any further investigations that might, in retrospect, usefully be made.

South Middlesex Hospital,
Isleworth, Middlesex. G. E. BREEN
R. T. D. EMOND.

VIVA-VOCE EXAMINATIONS

SIR,—It is generally agreed by psychiatrists that the unconscious transference of the emotions of love and hate between patient and therapist is the most potent factor in the psychotherapeutic interview. It is not only in psychiatric treatment, however, that this phenomenon plays an important part, and even statesmen would do well to recognise its importance in their dealings with each other.

There is one aspect of this matter which seriously affects recruits to the medical profession in viva-voce examinations. The candidate is inevitably in a state of nervous tension, and under these conditions a powerful transference situation arises between examiner and examinee. So often a candidate will pass in his paper and fail in his viva, not through lack of knowledge, but

by this unconscious factor which interferes lamentably with his self-confidence.

Since failure may result, today, in his having to give up a medical career after having spent several years and much money on a medical training, it would seem very unjust that a possibly brilliant career should be jeopardised by such an irrational element. Would it not be possible, in cases where this occurs, for the candidate, having passed his paper, to appeal against the decision of the viva-voce examiner, and be given a second chance by another examiner?

Bath. E. R. MATTHEWS.

VAGITUS UTERINUS

SIR,—I can add another case to those enumerated in Mr. Russell's interesting article last week. I did not report it at the time as I thought that the existence of the phenomenon was unquestioned.

In this case, when I was resident obstetrician at Park Hospital, near Manchester, I was scrubbing up to do a forceps delivery on a woman who had had premature rupture of the membranes. I am unable to recall the indications for forceps delivery, but the woman had only had vaginal examinations and no manipulations. Suddenly the uterine cry of the baby was heard by myself, by the anæsthetist, by the sister in charge, and by the staff nurse. It was repeated on a number of occasions, and when delivery was effected the baby continued to cry lustily during the extraction as well as immediately afterwards. No ill effects were observed on the baby, whose cry in the uterus was quite strong and could be heard distinctly by me standing several yards away scrubbing up at the time.

Manchester. B. SANDLER.

SIR,—Mr. Russell's article reminds me that several years ago, when I was in private practice, I was puzzled by the fact that in a primipara with an apparently normal left occipito-anterior position the membranes ruptured two weeks before delivery.

When she went into labour I found that one of the child's hands was at the side of its head, and causing obstruction. Manual replacement having failed, and no progress being made, I decided to apply forceps as the cervix was well dilated. Then it happened! At 2 A.M. in a silence that could be felt, a distinct muffled cry occurred, coming from the mother's abdomen. I turned to the maternity nurse, and her normally rubicund face was ashen with shock.

A perfectly normal forceps delivery followed, and the child cried at once, with no ill effects.

Health Department,
Shoreditch Town Hall,
London, E.C.1. B. BROADBENT.

MEAN VENOUS PRESSURES IN THE FIRST HOURS OF LIFE

SIR,—We are indebted to Dr. Brown (Jan. 19) for at least two reasons. His letter gives us a chance to acknowledge the work of the Oxford physiologists, G. V. R. Born et al.,[1] and it will bring this excellent work into greater prominence in medical circles. We did know of it and perhaps should not have been so species specific. Dr. Brown's letter also gives us the chance to emphasise the oddity in our paper. This is not that the venous pressures in the fatal cases were "low" (they fell in fact within the normal range) but that the survivors' pressures were "high"—i.e., over 5 cm. dextrose solution. If we might amplify this a little further without too much speculation, we would like to do so by commenting on Potter's phrase "pulmonary congestive failure."

A circulation can fail because the propulsive power of the heart diminishes; because the vascular resistance to this propulsive power becomes too great; because there is not enough blood to pump round; or because of combinations of these. The Oxford group have shown in lambs the great increase in vascular resistance in the pulmonary circuit caused by asphyxia; we do not yet know what the vascular resistance is in normal unexpanded human lung, but it is possibly high. To overcome this and any increase due to asphyxia it is possible that a high cardiac output dependent upon a high venous pressure is necessary. Many serial readings in both groups were done but were not included because of the possible effects of therapy. They showed in general that in the survivors the pressure returned to normal levels with clinical improvement within 12 hours, and in the fatal cases did not rise except in one as a terminal event after 30 hours.

1. Born, G. V. R., Dawes, G. S., Mott, J. C., Widdicombe, J. G. *Cold Spr. Harb. Symp. quant. Biol.* 1954, **19**, 102.

University College Hospital, London, W.C.1. R. E. BONHAM CARTER
JEAN M. SMELLIE.

A SIMPLE SELECTIVE TEST FOR NURSES

SIR,—I accept Dr. Haward's explanation (Jan. 5) that his test was offered as a supplement, and I agree that these are early days for nursing selection techniques. Nevertheless, one cannot help being mildly suspicious of its apparent intention to measure "scholastic ability"—a supplement at that. If it is ever to be put forward as a test "par excellence," then it should attempt, even at this early stage, to measure concentration as a separate factor.

Dr. Haward asks me what I mean "by requesting a correlation for *each* student?" I will merely say here that on occasion I have found students who, though they could not give suitable written answers to questions, could dictate "excellent" answers. Such cases justify my previous criticism of Dr. Haward's test, that it does not attempt to measure "writing fluency"—an important consideration. An intelligence test is the better alternative in *such cases*.

Runwell Hospital,
Wickford, Essex. T. ROBERTS.

X RAYS AND LEUKÆMIA

SIR,—My letter of Dec. 15 was prompted by a consideration of the practical steps which radiologists would have to take if they accepted Dr. Stewart's findings. Perhaps it may help to restate the problem. Dr. Stewart's results have, for the first time in the history of radiology, suggested that a very small dose, hitherto regarded as absolutely safe, may be harmful. If, in fact, a dose of 1r (to a fœtus or adult) can cause leukæmia in later life then we must revise our view that a dose of 0·3r per week for every week of the working life of a radiographer or radiologist is harmless. Radiation doses are cumulative; therefore a dose of 1r every three weeks or 16r every year has been permitted for an X-ray worker. A whole-body dose of well over 200r during a working life has hitherto always been considered safe. On Dr. Stewart's figures, we are jeopardising the lives of all who work in diagnostic departments, because it is impossible to keep the radiation scatter dose below 1r in, say, ten years without rebuilding every diagnostic department and without stopping all screening.

I therefore examined Dr. Stewart's report in the hope of finding a simple explanation for her surprising results. The figures are entirely based on statistical not on clinical considerations. The word "routine" on an X-ray form has been interpreted as meaning that the patient is perfectly fit; but to a radiologist or obstetrician it indicates that there is suspicion of either a fœtal abnormality or some maternal disease.

In my experience a pregnant mother is never referred for an X-ray examination unless there is some definite suggestion of either maternal or fœtal abnormality, but this is seldom mentioned on the form, because that is usually handed to the patient.

Moreover, Dr. Stewart does not explain why 15 more of the leukæmia mothers had non-abdominal X-ray examinations than did the mothers in the control group before conception of the survey child. The total excess of X-ray examinations on leukæmic babies over normal controls is

only 18, and it is on this figure alone that the whole of Dr. Stewart's argument is based. Both sets of figures may be of equal importance, and the only way in which they can be explained is by stipulating a pre-existing morbid factor, in either mother or fœtus, which predisposes to the later occurrence of leukæmia.

Dr. Court Brown and Dr. Doll, in their very interesting reply (Jan. 12) to the points I raised, state that 20,000,000 people will have to be exposed to a mean marrow dose of 1r in excess of that received by the general population and observed for ten years before it can be decided whether or not a dose of 1r can be responsible for leukæmia. This may be the statistical ideal, but it does not seem feasible to apply such a method in practice.

In the consideration of low-level radiation effects, however, the data which we possess on the general incidence of leukæmia are most helpful. Natural atmospheric background radiation received by every human being amounts to 0·1r per year. Therefore, after ten years, everybody has been subjected to 1r, and after a lifetime of seventy years, to 7r. If small doses of radiation are a cause of leukæmia one would expect, on statistical grounds alone, that as dose increased with age so would the incidence of leukæmia; and, in fact, this is not so.

Dr. Court Brown and Dr. Doll consider that the present evidence does not justify the belief in a threshold dose of between 100 and 200r, but they have not been able to adduce a single fact or experiment in which it has been proved that a low dose of radiation was leukæmogenic. To their comments I should like to make the following points:

(1) They attribute the absence of leukæmia in the offspring of pregnant mothers in Hiroshima to shielding by buildings. I gave the figure of 1500r as a maximum dose to which some had been exposed. The fact that so many of them developed severe radiation injuries indicates that they must have been exposed to many hundreds of r. While these women had many abnormal children, especially microcephalics, none of them developed leukæmia within nine years of observation.[1]

(2) I suggested that among the survivors of Hiroshima and Nagasaki beyond a distance of 2000 metres, doses of 100 or even 200r must have been common because so many people had radiation sickness. Dr. Court Brown and Dr. Doll think that this may be the malaise, with nausea, vomiting, and diarrhœa, induced by physical and emotional stress. I am convinced that the very careful investigators of the Atomic Bomb Casualty Commission would not have classified these cases as due to radiation if they had been of psychological origin. I cannot remember similar symptoms in people exposed for months on end to the stresses of air raids in this country. But even if the total exposure dose received by the 155,000 people was only 8r at a distance beyond 2000 metres, that still confirms my original contention that such a dose was inadequate to increase the normal incidence of leukæmia. If Dr. Stewart's argument is correct, then even this low dose would have raised the amount of leukæmia considerably beyond the normal limits. Yet the incidence among the very large number of exposed people remained roughly within normal limits.[2]

(3) In quoting the figures collated by Dr. Court Brown and Dr. Doll on the radiation treatment of ankylosing spondylitis, I intended to give further support to my argument that all recorded cases of post-radiation leukæmia were caused by large doses—in this case, doses of at least 400r.

(4) I fully admit that the course of leukæmia in animals after irradiation [3] is not exactly comparable to that in human beings. Nevertheless it seems unlikely that man is 100 to 200 times more susceptible than a rat, or that a dose of 1r produces leukæmia in man when 2500r is needed in dogs. Experiments have proved that a small dose must be repeated many hundred times in every kind of animal before a tumour develops. With a daily dose of 0·1r at 250 kV it was not possible to produce leukæmia in rats, however many doses were given. With 0·5r daily at 250 kV, 225 and 491 treatments had to be given before leukæmia occurred in 2 animals. With 1r daily at 1000 kV, it was impossible to induce leukæmia in any of 42 rats. Though animal experiments were not primarily designed to investigate low-level radiation, the fact that leukæmia could not be induced with these doses suggests that a fairly substantial dose is, in fact, needed to produce it.[4]

I am glad that radiologists, such as Dr. Brailsford (Jan. 5), with many decades of experience have confirmed that they have never seen a case of leukæmia which could be attributed to a diagnostic dose of radiation.

For practical purposes the risk to the fœtus (even assuming there is one) seems so small as to make it desirable to counteract the erroneous impression created among the general public by the preliminary results of the investigation. At present, when the recruitment of radiographers is becoming increasingly difficult, an official statement by the Faculty of Radiologists on the lack of evidence that small doses of radiation are harmful might be appropriate.

London, W.1. J. RABINOWITCH.

1. Plummer, G. *Pediatrics*, 1952, **10**, 687.
2. Folley, J. H., Borges, W., Yamawaki, T. *Amer. J. Med.* 1952, **13**, 311.
3. Medical Research Council Report. Cmd. 9780. H.M. Stationery Office, 1956; p. 87.
4. Metcalf, R. G., Inda, F. A. *In* Biological Effects of External Radiation, New York, 1954.

Medicine and the Law*

The Duty of Care

IN a case at the Glamorgan Assizes before Mr. Justice Sellers the duty of care owed by a hospital committee for the state of the hospital premises was under scrutiny.

The widow of a patient claimed under the Fatal Accidents Act 1846 for herself and under the Law Reform Act 1934 for her husband's estate. The husband, aged 59, a diabetic for many years, had returned home early from work feeling dazed and giddy. He was admitted to hospital in the afternoon to a general male surgical ward, and seen by the sister and doctor who made routine examinations. Next morning, apparently very cheerful as usual, he went to wash and to the sluice-room. A few minutes later he was found dead in the yard beneath a corridor window. The window was open and there was some scraping on the brickwork below. It seemed clear that he had fallen; but there was no reliable evidence as to whether the window was open before he went along the corridor, or information as to who had opened it.

According to the medical evidence called for the hospital it seemed that the possibility of a prediabetic coma producing uncontrolled swaying in this man was slight; and that the duty owed must be seen as that owed to a general ward patient. In giving judgment for the hospital the judge based his conclusions on the foreseeability of the event happening. If the reasonable man could have foreseen that this accident was "on the cards" and that to prevent it steps ought to have been taken to make the windows secure, and those steps were not taken, the hospital might have been liable in negligence. But this was a corridor window, the sill 2 ft. 3 in. from the ground (its total depth 15 in.), and the lower sash opened to 2 ft. Nothing unusual had been observed in the conduct of the patient to make extra precautions necessary; and allowing the patient to move about was a feature of treatment, in that maximum freedom of movement was desirable. For young children or mental patients extra precautions seemed clearly necessary, but it appeared to be unreasonable and even undesirable to restrict the amount of air and the sense of freedom available in the hospital. The widow had admitted that, though she and her family tried not to leave the deceased alone in the house, he might well be upstairs on the first floor alone, and no blocks had been fitted to the windows. The position

there seemed to be parallel to the state of affairs in the hospital.

There was one other feature. In 1954 a patient had apparently committed suicide by jumping through a window at the hospital, and blocks had been fitted by order of the committee responsible, so that the window opened to no more than 7 in. On the painting of the frames the blocks were removed from this and other windows, and there seemed no clear evidence as to why the blocks on this window had not been put back. The question then arose—had the hospital set itself a standard of care in supplying blocks, the removal of which by some servant of the hospital, and the failure to replace by a relevant authority, had provided the required incident of negligence? His Lordship did not accept this as a test, and applied clearly the test of reasonable foreseeability so that, to avoid the situation whereby the hospital authorities became insurers, the defendants were held not liable to the widow. The floor was in a good condition, and the height and width of the ledge made it improbable that the man could have fallen unless already part projected through the window frame. It was difficult to see what blame—since fault and breach of duty must be seen in this tort—could be cast upon the hospital committee or its servants for an incident which could not reasonably have been foreseen as likely to happen.

"Truth Drugs"

Narcoanalysis is a legitimate and valuable technique in psychotherapy, though it is true to say that the barrier to repressed material can often be raised by analytical methods alone. If drugs are used, their main advantage is to speed up the process. But when the information that is sought is being held back by conscious suppression of guilty knowledge, drugs seldom release it. Most of the evidence suggests that voluntarily suppressed matters are rarely revealed under narcosis, and that "truth drugs" are useless in police inquiries. Indeed, a guilty person may, under narcosis, manufacture evidence to suit himself, or what is worse, devise fantasies involving himself in crimes he has not committed. Moreover, the suggestible neurotic or psychopathic criminal can be made to say almost anything. These and other objections to evidence obtained under the influence of drugs were well brought out at a meeting[1] of the Medico-Legal Society.

Even if there were a drug that could unlock the truth, statements made under its influence would clearly be inadmissible in a court of law. First, it is a fundamental legal principle that a statement must be made voluntarily without threat, duress, or other influence. Secondly, the statement would have to be read by the doctor who administered the narcosis, or someone other than the accused, and that would make it hearsay and therefore inadmissible. The principle at the root of the British exclusion of hearsay evidence is the absence of the oath. It is clear that a man deprived of his senses cannot swear to speak the truth, and when he regains full consciousness he is at perfect liberty to say that his statement under the drug was nothing but a product of delirium and without a vestige of truth.

Only a qualified doctor should induce narcosis—yet few would be prepared to do so for reasons other than medical treatment. Indeed, it is hard to imagine a more striking breach of the Hippocratic oath than the use of medical skill to obtain evidence that will lead to a prison sentence. Moreover, the doctor concerned would have to be called by either prosecution or defence, thus immediately seeming to show partiality; and the doctor could, quite fairly, be charged by the other side with the manufacture of evidence by suggestion—a charge which would be hard to refute.

1. *Med-leg. J.* 1956, **24**, 89.

Obituary

ERIC BARRINGTON BROOKE

M.A., M.B. Camb., F.R.C.P., D.P.H.

GERIATRICS is one of the youngest of the specialties, and by the death of E. B. Brooke it has lost one of its pioneers. His work at Carshalton and later at Southampton was a memorable demonstration of how much can be achieved by personality in administration.

Dr. Brooke was educated at Bradfield College, Cambridge University, and St. Bartholomew's Hospital. After qualifying in 1923 he held house-appointments at Barts, and later became assistant medical officer at St. Giles Hospital, Camberwell. In 1925 he took the D.P.H. and two years later the M.R.C.P. The next years he spent at Redhill Hospital, Surrey, at first as deputy medical superintendent and then as superintendent. But the most important part of his work began with his appointment in 1941 as superintendent of St. Helier Hospital, Carshalton. D. D. relates how he met the challenge of those war-time days when the buildings under his charge were new and empty, and when man-power and materials were difficult to obtain:

The patients at St. Helier in the early years were a heterogeneous collection — evacuees from London hospitals, air-raid casualties, and soldiers, as well as people from a large area of North Surrey. Determined to make the best use of the beds, Dr. Brooke kept a close personal watch on all the wards, but he never interfered with the clinical work of his colleagues in other departments. Indeed, no matter how remotely any new development or change of administrative policy might affect our work, he invariably sought our opinions before taking action. With the general practitioners of the area, also, he established a friendship and coöperation which they and the hospital staff continue to enjoy. His geriatric work grew out of his personal interest in the patients and their doctors, for, try as he would, the aged sick could not always be admitted to hospital, and often had to wait for a bed. He worked out a scheme to help them to live more happily at home, perhaps after a short stay in hospital for investigation and rehabilitation, and his imaginative understanding of the needs of old people led him to bring hospital facilities, laundry services, and meals-on-wheels to their homes, so that hospital beds could be freed for more urgent cases.

His determination was well exemplified by the way he managed somehow to extricate himself unaided, in spite of severe facial injuries, from his house when it was reduced to ruins by one of the bombs that fell on the hospital. Returning to work after treatment, he would joke about our "one-eyed superintendent" and regale us with stories of the matey people whose company he had enjoyed in the large ward that he preferred to a private one during his short stay at a convalescent hospital. The secret of his success seemed to lie in his intense interest in people and his almost boyish sense of humour. In the early days he knew all his staff well, from maids to medical specialists and, as the work of the hospital grew, he still managed to retain this personal touch. His aim was to have a happy as well as an efficient hospital, and visitors from many countries whom he conducted round it never failed to be impressed by the atmosphere that he had created.

Another of the innovations he introduced to meet an administrative emergency was domiciliary visiting, which quickly proved its clinical worth and is now an

accepted technique in the care of the aged. P. McE., who visited St. Helier in those early days, describes a domiciliary-visit round on which he accompanied Dr. Brooke.

With Dr. Brooke was his registrar and his secretary. First he had a short talk with the relatives; then he investigated the patient. Then the relatives, the secretary, and Dr. Brooke (or the registrar) went over the whole matter and gave advice and decisions, and the secretary made the necessary notes for the case-record. It was all simple, easy, free from fuss. The procedure had a wonderful effect on waiting-lists, and Dr. Brooke was, through his secretary, in constant friendly touch with doctors.

Of a hospital ward round J. N. A. writes:

Dr. Brooke was extremely gentle and considerate both to his patients and to those of us who went (as I did) to learn from him. Yet he was an animated and tireless man. Going round his wards with him I perhaps got the impression he was not first and foremost a clinician. He loved the administrative aspect and the logistics of geriatric work. But he was a humanist: his patients loved him, and he knew them (450 at a time) almost all by name and background.

In 1953 he was elected F.R.C.P. By then the empty building that he had taken over had been for several years a very busy general hospital of over 700 beds and had gained an international reputation for its geriatric work. But Dr. Brooke was not content to stay and watch the results of his work, for he still had the spirit of a pioneer. He left St. Helier to reorganise a geriatric service in the Southampton area. There he followed, though on a wider scale, the principles of administration that had served him so well at Carshalton. Broadly speaking, the acute geriatric beds at Southampton General Hospital were used for the clinical assessment and treatment of new patients. Those who responded to treatment returned home or were admitted to welfare establishments, while those who failed to do so were transferred to long-stay beds in one of the three outlying hospitals. He continued to be a firm believer in the domiciliary visit before the patient's admission to an acute bed and in "half-way houses" for "frail ambulants" before their admission to welfare homes. Financial stringencies often frustrated his best intentions, but he lived to see much-needed reconstruction both at Moorgreen and Ashurst Hospitals.

Though he was dogged by ill health he filled his professional life with more hours of work each day than most fit men can manage. He was a founder member of the Medical Society for the Care of the Elderly and he hardly ever missed a meeting in whatever part of the country it was held. He travelled abroad to many international conferences, and he was always willing to help, as counsellor or speaker, when any organisation for old people was being started. He was a fluent speaker, a master of the happy phrase, and he delighted in appropriate quotations from the lyrics of W. S. Gilbert and the poems of A. A. Milne.

Dr. Brooke died at his home at Southampton on Jan. 13. He leaves a widow and two adopted children.

RUFUS CLIFFORD THOMAS

F.R.C.S.E., F.R.C.O.G.

IN 1937 Croydon started a comprehensive obstetric service offering "antenatal, natal, and postnatal supervision under the same specialist obstetrician," and Mr. Rufus Thomas, who was already on the staff of the council, was appointed to its charge as assistant medical officer for obstetrics and gynæcology. In 1945 he reported in our columns that it covered three-quarters of the births of Croydon, and before he retired in 1948 the scheme had made civic and public-health history as an exercise in coöperation and coördination.

He qualified from Westminster Medical School in 1915 and held house-appointments there. After serving in the R.A.M.C. he became supervisor of anæsthetics in the gynæcological department of Edinburgh Royal Infirmary and later senior anæsthetist to the Royal Gwent Hospital, Newport, Monmouth. In 1924 he took the F.R.C.S.E. He next spent six years in India as chief medical officer to the Maharajah Jamsaheb of Nawanagar (better, if less formally, known to many as Ranji). For his work at Jamnagar Mr. Thomas was awarded the order of merit of the State of Nawanagar. In India he continued to make a special study of obstetrics, and soon after his return to this country he joined the staff of the Croydon public-health department, as clinical head of its maternity and gynæcological service.

O. M. H., who worked with him as M.O.H. of the borough, writes:

Under a quiet and retiring manner Thomas hid an alert, incisive, and analytical mind, eager always to try new ideas, to formulate his own, and to put his whole personality into ensuring their success. He made an ideal head of a complex clinical unit. By his clinical skill and dexterity, and his understanding of their problems, he had the respect of the doctors, nurses, and midwives under his direction. Never demonstrative, always courteous and calm, he obtained the unquestioned confidence of those for whom and with whom he worked. To me, as his old chief, his memory will remain that of a completely reliable and loyal colleague, and a very likeable and cultured Welsh gentleman.

In 1947 he was elected F.R.C.O.G., and the following year he retired from his Croydon appointment under the age-limit. He continued to lecture and examine for the Central Midwives' Board and he was consultant obstetrician and gynæcologist to Kent County Council:

R. G. S., one of his surgical colleagues, recalls first meeting him in 1939 at Croydon:

I soon learned to respect both his clinical acumen and manual dexterity. He brought to his chosen specialty a vast experience in general medicine and surgery, gained largely in India, and his flair for diagnosis evolved partly from this and partly from his careful attention to detail and to routine observations. He expected the same high standard from his subordinates and inspired them by his example. In addition to his clinical work he took an active interest in many other aspects of medicine, and his sagacity and foresight were of great help to his colleagues on the many committees on which he served, often as chairman. His enforced retirement saddened him for a while, but, with typical zest, he continued with his committee work and found time at last to play his beloved golf, a game at which he excelled. His other hobbies were fishing and story-telling, for he had an apparently inexhaustible supply of anecdotes about the years he spent in India and had a remarkable memory for detail.

Mr. Thomas, who died on Jan. 11, leaves a widow and a daughter.

Appointments

BEGG, W. G. A., M.B. Glasg., D.P.M.: assistant psychiatrist based at Glengall Mental Hospital, Ayr.

CHAMERETTE, N. P. PALMER, M.B. Hong-Kong, D.P.M.: part-time psychiatrist, child-guidance clinic, Manchester.

CHAPPLE, C. F., M.B. Adelaide, F.R.C.S.: consultant orthopædic surgeon, Mansfield Hospital area, Sheffield.

GORDON, V. D., L.R.C.P.I.: medical superintendent, Inverness group of hospitals.

GORDON-RUSSELL, J. B., M.B. Aberd, M.R.C.P., D.P.M.: medical superintendent, Roundway Hospital, Devizes.

GOULDING, ROY, M.D. Lond.: senior M.O. (pharmacologist), Ministry of Health.

NELSON, I. D. M., M.B. Belf., D.P.H.: M.O.H., Barrow-in-Furness.

REES, D. L., M.D. Lond., M.R.C.P.: consultant dermatologist, Glantawe H.M.C.

WOODS, GRACE E., M.D. Brist., D.P.H., D.C.H.: deputy medical superintendent, Hortham Hospital, Almondsbury, near Bristol.

Colonial Appointments:

BONNER, FREDA B., M.B. Dubl.: assistant M.O., Bahamas.

CRAWFORD, W. S., M.B.: M.O., Kenya.

JUPP, T. P., D.F.C., M.R.C.S.: assistant M.O., Bahamas.

MARKHAM, J. W., M.B. Lond.: assistant health adviser, Aden.

MELVILLE, H. A. H., M.B. Wales, D.OBST.: M.O., General Hospital, Barbados.

POCOCK, RUTH E. E., M.B. St. And., D.OBST.: M.O., Southern Cameroons, Federation of Nigeria.

STEWART, D., L.R.C.P.E., D.P.H.: M.O.H., Jamaica.

STIGGELBOUT, J., M.D. Amsterdam: M.O., Northern Nigeria.

THOMPSON, P. B., M.B.: M.O., South Pacific health service, Fiji.

YOUNG, J. K., M.B. Sheff.: M.O., Kenya.

Notes and News

WORLD HEALTH ORGANISATION

THE nineteenth session of the executive board of the World Health Organisation is being held under the chairmanship of Prof. G. A. Canaperia from Jan. 15 to Feb. 5 in Geneva. The proposed budget of $12,048,000 for 1958 represents an increase of $1,348,000 over the 1957 budget, designed to restore the level of field activities originally proposed for 1957 but cut by the World Health Assembly.

QUACKS THROUGH THE AGES

IN an entertaining lecture to the Royal Society of Arts last November, Mr. A. Dickson Wright defined a quack as "one who sells a secret remedy." He spoke of many of them, from the *Apocrypha* to the present century, showing that they were often favoured by notabilities and the public, despite the indifferent success of their treatment. Oberndorf, in 1602, described "quack-saluers" in language worthy of Sir Thomas Urquhart. Less harshly, Mr. Dickson Wright concluded that "essentially they are those who choose short cuts to the curative art and avoid the trial and tribulation of the long and arduous training in medicine."

VIDIUS

AMID our present vicissitudes we may do worse than look to our past for guidance; and what more pleasant way of doing so than to read, for instance, Dr. Brockbank's Thomas Vicary lecture,[1] which he called The Man who was Vidius? Was medical life more satisfying in the 16th century, or were the frustrations to be met under the patronage of Kings and Princes as withering as any that bureaucracy can offer?

To most of us Vidius is no more than a name to be connected in a vague way with the Vidian nerve. Born in Florence when the Renaissance was in full flower, a Greek and Latin scholar with an easy style in the latter language, and fortunate in having family connections with the arts, Guido Guidi (he later latinised his name to Vidius) was a highly esteemed and successful practitioner of medicine in his home city before he went to Paris on the invitation of Francis I in 1542. It was in Paris that he completed the translation from Greek to Latin, with commentaries and additions of his own, of a set of ancient manuscripts containing certain works of Hippocrates, Galen, and Oribasius. It is on this book, entitled *Chirurgia*, that his fame rests; the more massive *Ars Medicinalis*, completed and published after his death by his nephew, at Guidi's request, contains more of his personal teaching on medical matters, but only the section on anatomy can be regarded as important. Even those who cannot read the text of the *Chirurgia* can understand and enjoy the magnificent woodcuts with which it is adorned—some of them being reproduced in Dr. Brockbank's paper. They are mostly illustrations of methods by which forcible traction could be applied to dislocated or fractured limbs. Force was the watchword: levers, screws, the windlass, block and tackle, and gravity were all brought into play, and no doubt force was necessary to overcome the spasm in muscular subjects fully conscious.

Whether a doctor's life was better in those days than now may be arguable, but there is no doubt where the patient's preference would lie; for the surgical apparatus of the period, despite its humane purpose, bore a striking resemblance to the instruments used for torture.

MATERNITY FILM

Birth of a Baby is a re-issue of a 17-year-old film for cinema audiences which has been modified to incorporate advances (U.S.A., 62 minutes).

Mary Burgess visits her doctor, who confirms her pregnancy and then explains, with the aid of diagrams, the physiology of conception and implantation of the ovum. He advises her to live normally, avoiding strenuous exercise and horse-back riding. On receiving a normal blood report, the doctor comments on the rhesus factor which, in Mary's case, is positive and therefore not incompatible with her baby's blood, and he then tells his nurse that he wishes his patients could have their babies in hospital, as do most American mothers now, instead of at home. Recounting a recent visit to a New York Lying-in Hospital, we see a group of expectant mothers with their husbands on an antenatal tour of the maternity department and labour wards. At parents' classes Mrs. Burgess attends lectures and demonstrations which are shown in some detail, and the doctor comments that those who attend the classes make better patients and happier people. Fathers are also encouraged to attend. The anatomy of the birth canal and the mechanics of parturition are described briefly with models and, at her final visit to her doctor before the delivery is due, Mrs. Burgess listens to her baby's heart through a stethoscope. Finally the delivery at her home is shown briefly, silver nitrate being dropped into the infant's eyes; and the film ends with an account of the advantages of breast-feeding.

Rhesus-negative mothers might be unduly alarmed until they can discuss the film with their doctors, and references to "anæsthesia during labour, but you will be awake to see your baby born" give a muddled impression. Technically the film is bad; the retained portions of the old film, showing the age and dress of the characters seventeen years ago, is mixed haphazardly with modern shots, the contrast in photographic quality and sound recording accentuating the differences. The film is unlikely to cause the sensation it did when first shown publicly in this country.

TRAINING OF THE DISTRICT NURSE

WHEN the working party on the training of district nurses presented its report, we expressed concern at the recommendation by the majority that the period of training should be cut.[1] We hoped that the minority view would prevail, and that the period would remain that recommended by the Queen's Institute of District Nursing. The report was discussed at a meeting of the Queen's Institute later that year,[2] when the proposal to shorten the course found no support. The differences in technique and approach between home and hospital nursing, and the time needed to learn these, were emphasised.

A revised syllabus [3] has now been published. The lectures have been increased in number and changed in emphasis to accord better with modern needs, but the period of training is to be as long as it was before—i.e., six months for State-registered nurses without special qualifications, and four months for those who are also midwives, health visitors, or tutors, or have had at least eighteen months' experience in district nursing.

University of Bristol

On Jan. 18 the following degrees were conferred:

M.D.—D. R. Coles, C. H. Gurd, Lisa E. Hill, Roy Hill.
Ph.D. (in the faculty of medicine).—Syed Murtaza Ali Zaidi.

University of St. Andrews

At a recent final examination for the degrees of M.B., CH.B., the following were successful:

I. M. Aitkenhead, L. R. Butler-Manuel, D. C. Crawford, R. A. Haddow, Philip Hossen, M. J. Illingworth, *D. W. Jervis, J. L. Maddison, J. P. M. Penney, D. J. Sutherland, *T. T. Thompson, H. E. G. Thomson, Elinor M. Whyte.

* In absentia.

Welsh National School of Medicine

Dr. J. G. Lawson, lecturer in obstetrics and gynæcology, University of Aberdeen, has been appointed senior lecturer in obstetrics and gynæcology.

Empire Rheumatism Council

This council is appealing for £250,000 to enable it to carry out a 10-year programme of concentrated research. Contributions should be sent to the Council, Tavistock House (N), London, W.C.1.

Royal Society of Medicine

Section of Anæsthetics.—This section offers a prize (£30) for the best paper submitted by a senior registrar or registrar holding a clinical appointment in an anæsthetic department of a hospital. Papers for the 1958 award must be submitted by Jan. 1, 1958. Further details may be had from the hon. secretary of the section, 1, Wimpole Street, London, W.1.

Sheffield Regional Hospital Board

In this board's research prize competition for 1956 prizes of £50 each have been awarded to Dr. A. H. Morris, senior registrar in diagnostic radiology at Leicester Royal Infirmary, for his entry on radiological features of Hodgkin's disease in the thorax, and to Dr. N. M. Gibbs, senior registrar in clinical pathology at Derbyshire Royal Infirmary, for his entry thrombo-embolism.

---

1. Brockbank, W. *Ann. R. Coll. Surg. Engl.* 1956, **19**, 269.

1. *Lancet*, 1955, ii, 543.
2. See *Ibid*, p. 1331.
3. Syllabus of the Course and Regulations governing the training and examination in District Nursing given in Training Centres approved by the Queen's Institute of District Nursing: 57, Lower Belgrave Street, London, S.W.1. November, 1956.

Society for Biological Rhythm

This society is to hold a conference from Aug. 26 to 28 at Semmering, Austria, on time in biology. Further particulars may be had from the secretary, A. Sollberger, anatomical department, Caroline Institute, Stockholm, 60, Sweden.

Laboratory Animals Bureau

Prof. J. H. Gaddum, F.R.S., will open the congress which this bureau is holding at the Royal (Dick) School of Veterinary Studies, Edinburgh, on April 4 and 5. Further particulars may be had from the bureau, M.R.C. Laboratories, Holly Hill, Hampstead, London, N.W.3.

National Association for Mental Health

The annual conference of this association will be held at Church House, Westminster, on April 11 and 12. The subject chosen for discussion is the maladjusted child, and the speakers will include Dr. Kenneth Soddy, Dr. John Bowlby, and Dr. Mildred Creak. Further particulars may be had from the association, 38, Queen Anne Street, W.1.

Seminar for Overseas Health Workers

This seminar will be held by the Central Council for Health Education at Passfield Hall, London, from April 15 to 19. The subject for study will be the principles, methods, and media of health education. Further particulars may be had from the medical director of the council, Tavistock House, Tavistock Square, London, W.C.1.

Royal Society

Dr. D. W. Kennard has been appointed Stothert research fellow. He will carry out research at the Physiological Laboratory, Cambridge, on the reflex activity of the spinal cord.

On Thursday, Jan. 31, at 11 A.M., at this society, at Burlington House, Piccadilly, London, W.1, Mr. A. S. Parkes, SC.D., F.R.S., will open a discussion on the viability of mammalian cells and tissue after freezing. Other speakers will include Dr. P. L. Mollison and Dr. Audrey Smith.

Liverpool University Medical Students' Society

The annual dinner, for past and present members of this society, will be held at the Adelphi Hotel, Liverpool, on Feb. 7. Lord Cohen of Birkenhead will be in the chair and the guest of honour will be Prof. Stanley Alstead, president of the Royal Faculty of Physicians and Surgeons of Glasgow. Tickets (25*s.*) may be had from the Medical Dinner Secretary, Medical School, University, Liverpool, 3.

Mundesley Sanatorium

The East Anglian Regional Hospital Board is acquiring this privately owned sanatorium for use as a post-acute hospital which will serve the hospitals in the Norfolk and Norwich, Cromer, King's Lynn, Yarmouth and Lowestoft, and Bury St. Edmunds hospital groups (*Eastern Daily Press*, Jan. 9). The transition will be gradual, but it is expected that Mundesley Hospital will be in full use in about three months.

Société Française de Médecine Psychosomatique

This society, which was founded last year, would like to get in touch with other societies, groups, and individuals interested in the exchange of information on psychosomatic medicine. The president of the society is Dr. F. Moutier and the secretary is Dr. L. Chertok, Centre de Médecine Psychosomatique, 54, Avenue de la République, Villejuif (Seine), France.

Training in Hospital Administration

Applications for a further 16 training posts for hospital administrators are invited by the Minister of Health and the Secretary of State for Scotland under a scheme which began last year. The posts are open to young officers of promise already employed in the National Health Service and to university graduates and professionally qualified people who wish to make hospital administration their career.

The normal age-limit will be 30, but candidates up to the age of 35 will be considered. During their training, which will normally last for three years, the student administrators will be given practical experience with different hospital authorities and instruction at the Hospital Administrative Staff College of the King Edward's Hospital Fund for London or at the University of Manchester. Their fees will be paid and they will also receive a salary beginning at £510.

Over 500 applications were received last year; 143 of the candidates were already in the hospital service. 14 men (6 of whom already held hospital posts) and 2 women were selected.

Institute of Dermatology, London

A semi-permanent exhibition by Dr. G. Weddell on the neurohistology of the integument and changes in leprosy will be held at the institute, Lisle Street, W.C.2, from Feb. 5 to 25.

British Hospitals Contributory Schemes Association, 1948.—This association has published its directory of contributory schemes for 1956. Copies may be had (10*s.* post free) from the honorary secretary, Royal London Buildings, Baldwin Street, Bristol, 1.

Diary of the Week

JAN. 27 TO FEB 2

Monday, 28th

MANCHESTER MEDICAL SOCIETY, Medical School, University of Manchester
9 P.M. *General Practice.* Dr. J. H. Cyriax: Manipulative Medicine.

Tuesday, 29th

BRITISH POSTGRADUATE MEDICAL FEDERATION
5.30 P.M. (London School of Hygiene and Tropical Medicine, Keppel Street, W.C.1.) Prof. C. A. Keele: Causes of Pain.
ST. MARY'S HOSPITAL MEDICAL SCHOOL, W.2
5 P.M. Mr. T. L. T. Lewis: Use of Drugs in Modern Obstetrics.
INSTITUTE OF DERMATOLOGY, Lisle Street, London, W.C.2
5.30 P.M. Mr. A. K. Monro: Gravitational Ulcers.
ROYAL ARMY MEDICAL COLLEGE, Millbank, London, S.W.1
5 P.M. Sir Geoffrey Tcdd: Operative Treatment of Pulmonary Tuberculosis and its Prognosis.
ROYAL STATISTICAL SOCIETY
5.30 P.M. *Medical Section.* (Westminster Medical School, Horseferry Road, S.W.1.) Mr. F. D. K. Liddell: Statistical Problems of the National Coal Board Medical Service.
UNIVERSITY OF LIVERPOOL
5.15 P.M. (Arts Theatre.) Prof. Wilder Penfield, O.M., F.R.S.: Cerebral Cortex of Man—an Interpretation of Responses to Electrical Stimulation. (Sherrington lecture.)

Wednesday, 30th

POSTGRADUATE MEDICAL SCHOOL OF LONDON, Ducane Road, W.12
2 P.M. Dr. Norman Ashton: Pathology and Ætiology of Retrolental Fibroplasia.
INSTITUTE OF DERMATOLOGY
5.30 P.M. Dr. Henry Haber: Nodular Lesions of the Legs.
INSTITUTE OF DISEASES OF THE CHEST, Brompton, London, S.W.3
5 P.M. Dr. J. L. Livingstone: Asthma.
MANCHESTER MEDICAL SOCIETY
4.30 P.M. *Medicine.* Dr. H. T. Howat: Cancer of the Pancreas.
ROYAL FACULTY OF PHYSICIANS AND SURGEONS OF GLASGOW, 242, St. Vincent Street, Glasgow
5 P.M. Dr. Douglas V. Hubble: Homœostasis. (Burns lecture.)

Thursday, 31st

ROYAL COLLEGE OF SURGEONS OF ENGLAND, Lincoln's Inn Fields, London, W.C.2
5.30 P.M. Prof. E. W. Walls: Critical Anatomical Assessment of Certain Signs and Symptoms in Otorhinolaryngology.
UNIVERSITY COLLEGE LONDON, Gower Street, W.C.1
5.15 P.M. Prof. Franz Bergel, D.SC.: Recent Advances in Cancer Research.
INSTITUTE OF DERMATOLOGY
5.30 P.M. Mr. Monro: Skin Tumours.
UNIVERSITY OF ST. ANDREWS, Queen's College, Small's Wynd, Dundee
5 P.M. Dr. W. W. Payne: Renal Tubular Dysfunction in Childhood.

Friday, 1st

ROYAL SOCIETY OF MEDICINE, 1, Wimpole Street, W.1
10.30 A.M. *Otology.* Dr. G. Aschan, Mr. W. Stirk Adams, Mr. J. Angell James: Irradiation of the Nasopharynx.
2.30 P.M. *Laryngology.* Mr. W. A. Mill, Mr. R. J. V. Battle, Mr. J. H. Hovell: Facial and Palatal Repair in the Treatment of Malignant Disease.
5.30 P.M. *Anæsthetics.* Dr. D. W. Shannon: Resuscitation of the Burnt Child. Dr. H. G. Middleton: Anæsthesia for Burnt Children.
8.15 P.M. *Otology* and *General Practice.* Mr. L. R. S. Taylor, Dr. I. Friedmann, Dr. G. F. Abercrombie: Recurrent Otitis Media in Children.
POSTGRADUATE MEDICAL SCHOOL OF LONDON
10 A.M. Mr. H. Hamilton Stewart: Renal Calculi.
4 P.M. Sir John Parkinson: Syncope.
ROYAL MEDICO-CHIRURGICAL SOCIETY OF GLASGOW
8.30 P.M. (Royal Faculty of Physicians and Surgeons of Glasgow.) Mr. Donald Lawson, M.R.C.V.S.: Intervertebral Discs in Dogs.

Saturday, 2nd

INSTITUTE OF LARYNGOLOGY AND OTOLOGY, 330, Gray's Inn Road, London, W.C.1
NOON. Dr. J. E. Laage-Hellman (Goteborg): Surgery of the Parotid Salivary Gland.
NORTH EAST METROPOLITAN THORACIC SOCIETY
10.30 A.M. (London School of Hygiene and Tropical Medicine.) *Joint meeting with the South East Metropolitan Regional Tuberculosis Society and the North West Metropolitan Thoracic Society.* Mr. Donald Barlow, Dr. A. W. Frankland, Dr. Denis Leigh, Dr. F. J. Prime, Dr. Joseph Smart: Bronchial Asthma.
MIDLAND THORACIC SOCIETY
3 P.M. (Birmingham Chest Clinic, 151, Great Charles Street, Birmingham, 3.) Dr. L. E. Houghton: Cortisone and Chemotherapy in Pulmonary Tuberculosis.

OPENING A NEW AND QUICKER RELIEF FOR SKIN DISORDERS

The effectiveness of

Hydro-Adreson Ointment

is due to

★ *the hydrocortisone being included in*

★ ***the Neutral Base,*** *thus any skin irritation due to acidity or alkalinity is avoided.*

★ ***The Smooth and Pliable Consistency*** *which allows adequate coverage without additional injury from friction to already damaged tissue.*

This special bland base is free from excessive greasiness.

The Hydrocortisone it contains is now the acknowledged treatment of choice in many skin disorders.
Hydro-Adreson effectively reduces hyperaemia and oedema, relieves pain, and dries up exudative areas. By rapidly relieving irritation the ointment reduces the risk of further damage and infection from scratching and speeds the healing of lesions.

Hydro-Adreson (hydrocortisone free alcohol) ointment is supplied in tubes of 5 gm. or 15 gm. in two concentrations of 1% (10 *mg. per gm.) or* 2.5% (25 *mg. per gm.).*

ORGANON LABORATORIES LTD.
BRETTENHAM HOUSE, LANCASTER PLACE, LONDON, W.C.2

Telephone : TEMple Bar 6785/6/7, 0251/2.
Telegrams : Menformon, Rand, London.

Here's a girl who knows how to enjoy life. You wouldn't think she has much to worry about, yet she's going into hospital tomorrow for an operation. That's just about it: she has *nothing* to worry about. Without giving it a thought, she relies on the skill and experience of doctors and nurses: and they, in their turn, rely on British Oxygen equipment and gases. In thousands of cases, every day, British Oxygen equipment and gases are used to ease pain and to save lives.

BOC **BRITISH OXYGEN**

BRITISH OXYGEN GASES LIMITED, MEDICAL DIVISION, GREAT WEST ROAD, BRENTFORD, MIDDLESEX

Makers and suppliers of anaesthetic, analgesic and therapeutic equipment and gases.

Swann-Morton

SURGICAL BLADES AND HANDLES

Traditional and international

These eleven shapes of surgical blade have become traditional and—international. Hospitals all over the world send to Sheffield for ever increasing supplies; so the model factory built to produce Swann-Morton blades is always expanding. But, however great the pressure of orders, there is never any relaxation of the individual care given to each individual blade.

FIVE SIZES OF HANDLES, PRECISION MADE, COMPLETE THE RANGE.

W. R. SWANN & CO. LTD., SHEFFIELD, 6. ENGLAND

1786

Bavarian spas can help doctors to cure their patients

MANY of the health-resorts in Bavaria have been known for centuries past and are world-famous. Thousands of patients from all parts of the world recover their health in the fashionable climatic resorts, the spas and sanatoria in and arround the Bavarian Alps.

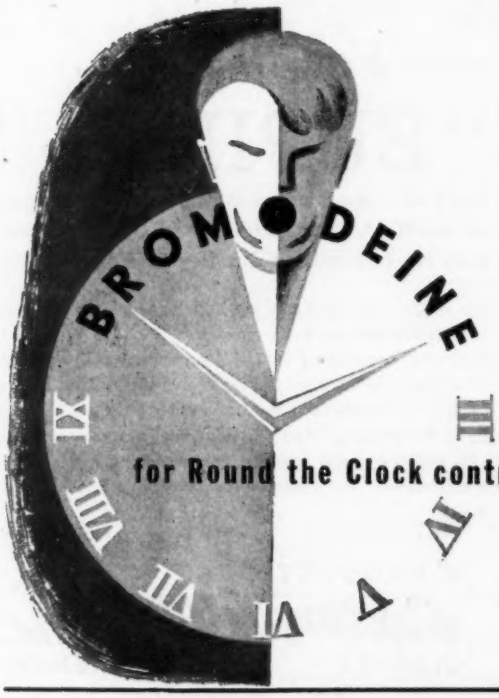
The greatest care is devoted to the patients' well-being. Local medical specialists work in close cooperation with their colleagues abroad for the benefit of their patients.

A detailed description of the 29 Bavarian health-resorts and spas will be sent on request.

TREATMENT OF:

Cardiac and vascular diseases • Muscular rheumatism • Rheumatism of the nerves and joints • Diseases of the respiratory organs • Diseases of women • Gastric, intestinal, hepatic and bilious complaints and metabolic disorders • Disorders of the hæmopoietic system • Neuralgia and neuritis • Endocrine disorders and those due to overstrain • Convalescence • ***Prospectuses available from the local spa Information Office (Kurverwaltung), and German Tourist Information Bureau, 6, Vigo Street, Regent Street, London, W.1.***

A copy (thirty-six pages) of "Cures in Bavarian Health Resorts" is available on application to Bayerischer Heilbaederverband Nr. L/2, Bad Kissingen, West Germany.



The anti-spasmodic and sedative action of codeine and bromoform help to control the cough without eliminating the cough reflex while the extracts of senega, krameria and wild cherry, give relief both to congestion and rawness in the chest.

Pleasant to take and suitable for all ages.

FORMULA: *Bromof. B.P.C. 0·85%, Codeine Hydrochlor. B.P.C. 0·25% Krameria, B.P., Prunus Serotina, B.P., Senega, B.P., as liquid extracts of each 1·14%.*

for Round the Clock control of COUGHS & CONGESTION

BROMODEINE

BOTTLES: *2oz., 4oz., 16oz., 80oz.*

BASIC N.H.S. COST: *10½d. per fl. oz.*

THE CROOKES LABORATORIES LIMITED • PARK ROYAL • LONDON • NW10

OTALGAN

Contains Procaine 1% Phenazone 5% in Anhydrous Glycerol

indicated for painful affections of the middle ear

Available for prescribing
in bottles of 6 gm. (Basic price 2/4)
in bottles of 12 gm. (Basic price 3/9)

SERUMWERK BASEL

Sole Distributors for Great Britain and Northern Ireland:

UNICHEM LTD., LONDON S.W. 17

About baby feeding-

HOW HEINZ STRAINED FOODS HELP

You can confidently recommend Heinz Strained Foods to mothers with young babies. They help to give the baby a fully balanced diet and offer convenience, with ease of preparation.

Heinz use the *freshest* vegetables and fruits. They cook and strain them under the most *carefully controlled* conditions, more hygienically than most mothers can, and with greater retention of food values.

For full details of the nutrient values of the 19 varieties of Heinz Strained Foods, write to Dept. 2S, H. J. Heinz Company Ltd., Harlesden, London, N.W.10.

57 HEINZ

Strained Foods

MEAT BROTHS · SOUPS · VEGETABLES · SWEETS · CEREAL

For 40 years

"EUPINAL"

has been used successfully in the treatment of ASTHMA and CHRONIC BRONCHITIS and may be prescribed on N.H.S. Form E.C.10

"Eupinal" contains Iodine and Caffeine combined in a most elegant and effective form.

In chronic Bronchitis "Eupinal" softens the tough accumulated mucus in the bronchial tubes and allows it to be more readily expectorated. In Asthma it possesses a more markedly soothing effect, lessening the frequency of attacks and reducing their severity and duration, and relieving breathlessness. "Eupinal" contains no poison and is safe in use.

A PRODUCT OF

Cuxson, Gerrard & Co. Ltd.

OLDBURY BIRMINGHAM

Phone: BROadwell 1355

HEIGHAM HALL, NORWICH

PRIVATE MENTAL HOME for Nervous and Mental illness. All types of treatment carried out. Accommodation for Alcoholics and Addicts available. Special Geriatric Unit now open. Fees from 7 gns. per week upwards according to requirements.

Apply to Dr. J. A. SMALL Telephone: Norwich 20080

SPRINGFIELD HOUSE

Phone: BEDFORD 3417 **Near BEDFORD**

For MENTAL CASES (including the aged)

Fees from Nine Guineas per week

For forms of admission, &c., apply to the Resident Physician, CEDRIC W. BOWER.

INTERVIEWS IN LONDON BY APPOINTMENT.

CHISWICK HOUSE

PINNER, MIDDLESEX

Telephone: PINNER 234

Private Nursing Home for Mental and Nervous illness. All modern forms of treatment. Two country houses in adjoining grounds of 5 and 6 acres respectively, 12 miles from London. Trains every 15 minutes from Baker Street to Pinner.

DOUGLAS MACAULAY, M.D., D.P.M.

BOWDEN HOUSE

HARROW-ON-THE-HILL, MIDDLESEX

Established in 1911 Tel.: BYRon 1011 & 4772

(Incorporated Association not carried on for profit)

A private clinic for the treatment of the neuroses and nervous disorders by psychotherapy and all modern physical therapies.

Apply: MEDICAL DIRECTOR

ST. ANDREW'S HOSPITAL FOR NERVOUS AND MENTAL DISORDERS

NORTHAMPTON

PRESIDENT: THE EARL SPENCER

MEDICAL SUPERINTENDENT: THOMAS TENNENT, M.D., F.R.C.P., D.P.H., D.P.M.

This Registered Hospital is situated in 130 acres of park and pleasure grounds. Voluntary patients, who are suffering from incipient mental disorders or who wish to prevent recurrent attacks of mental trouble; temporary patients, and certified patients of both sexes are received for treatment. Careful clinical, biochemical, bacteriological, and pathological examinations. Private rooms with special nurses, male or female, in the Hospital or in one of the numerous villas in the grounds of the various branches can be provided.

WANTAGE HOUSE

This is a Reception Hospital in detached grounds with a separate entrance, to which patients can be admitted. It is equipped with all the apparatus for the complete investigation and treatment of Mental and Nervous Disorders by the most modern methods; insulin treatment is available for suitable cases. It contains special departments for hydrotherapy by various methods, including Turkish and Russian baths, the prolonged immersion bath, Vichy Douche, Scotch Douche, Electrical baths, Plombières treatment, etc. There is an Operating Theatre, a Dental Surgery, an X-ray Room, an Ultraviolet Apparatus, and a Department for Diathermy and High-frequency treatment. It also contains Laboratories for biochemical, bacteriological, and pathological research. Psychotherapeutic treatment is employed when indicated.

MOULTON PARK

Two miles from the Main Hospital there are several branch establishments and villas situated in a park and farm of 650 acres. Milk, meat, fruit, and vegetables are supplied to the Hospital from the farm, gardens, and orchards of Moulton Park. Occupational therapy is a feature of this branch, and patients are given every facility for occupying themselves in farming, gardening, and fruit growing.

BRYN-Y-NEUADD HALL

The seaside house of St. Andrew's Hospital is beautifully situated in a park of 330 acres, at Llanfairfechan, amidst the finest scenery in North Wales. On the North-West side of the Estate a mile of sea coast forms the boundary. Patients may visit this branch for a short seaside change or for longer periods. The Hospital has its own private bathing house on the seashore. There is trout-fishing in the park.

At all the branches of the Hospital there are cricket grounds, football and hockey grounds, lawn tennis courts (grass and hard courts), croquet grounds, golf courses, and bowling greens. Ladies and gentlemen have their own gardens, and facilities are provided for handicrafts, such as carpentry, etc.

For terms and further particulars apply to the Medical Superintendent (TELEPHONE: Northampton 4354 (3 lines)), who can be seen in London by appointment.

CLIFFDEN, TEIGNMOUTH

For the early treatment of nervous disorders and patients needing rest and care

A well-appointed House with spacious balconies and extensive views of the South Devon Coast. Beautiful garden and own dairy in 35 acres in the same grounds. **ROWDENS**, a comfortable house with lovely views. Private road to the beach

There is also a charming house, **EBWORTHY, MANATON, DARTMOOR**, situated in 25 acres, 1100 ft. up for bracing moorland air

Resident Physicians—BERTHA M. MULES, M.D., B.S. ANNE S. MULES, M.R.C.S., L.R.C.P. *Telephones*—TEIGNMOUTH 289 and 537

THE MEDICAL PROTECTION SOCIETY LIMITED

Over 60 years experience in medical defence and protection

Complete indemnity granted to members in cases undertaken on their behalf

ANNUAL SUBSCRIPTION: £1 for first three years for newly qualified entrants and £2 thereafter

Full particulars from the Secretary (Dr. Alistair French), **Victory House, Leicester Sq., W.C.2.** Gerrard 4553 and 4814

Vacancies

ACADEMIC AND EDUCATIONAL SECTION *Page* 47

ADMINISTRATIVE
North West Met. R.H.B. Asst. Sr. M.O. 48

ANÆSTHETICS
Hosp. for Sick Child., W.C.1. Reg. 51
North East Met. R.H.B. Reg. .. 50
North West Met. R.H.B. P.-t. Cons. 48
Birmingham United Hosps. Reg. & Sr. H.O. 52
Bristol. Cossham/Frenchay H.M.C. Sr. H.O. 52
Chertsey. St. Peter's. Sr. H.O. .. 53
Enfield. Chase Farm. Sr. H.O. .. 53
Leeds R.H.B. Regs. 54
Manchester. South Manchester H.M.C. Sr. H.O. 55
Newcastle R.H.B. Cons. 48
Northwood. Mount Vernon. Reg. .. 56
Rochdale Infy. Sr. H.O. 56
Scotland. Western R.H.B. Regs. .. 57
Shrewsbury. Royal Salop Infy. & Copthorne. Sr. H.O. 57
South West Met. R.H.B. P.-t. Cons. 49
Stoke-on-Trent. City Gen. Sr. H.O. 58
Watford. Peace Mem. Sr. H.O. .. 58
Ibadan, Nigeria. Univ. College Hosp. Sr. Reg. & Reg. 59

CASUALTY
Memorial, S.E.18. Sr. H.O. 50
Princess Beatrice, S.W.5. Sr. H.O. .. 50
Royal Free, W.C.1. Sr. H.O. 50
Blackburn. Royal Infy. Jr. H.M.O. or Sr. H.O. 52
Brighton. Royal Sussex County. Jr. H.M.O. or Locum 52
Canterbury. Kent & Canterbury. Sr. H.O. 53
Chelmsford & Essex. Sr. H.O. .. 53
Douglas. Noble's Isle of Man. H.O. 53
Dudley, Stourbridge & Dist. Sr. H.O. 53
Hastings. Royal East Sussex. Sr. H.O. 54
Hertford County. Sr. H.O. 54
Liverpool. Bootle. Jr. H.M.O. .. 55
Maidstone. West Kent Gen. Sr. H.O. 55
Newcastle R.H.B. Sr. Casualty Officer 48
Oxford R.H.B. Reg. 56
Reading & Dist. H.M.C. Sr. H.O. .. 56
Romford. Oldchurch. Sr. H.O. .. 56
Sidcup & Swanley H.M.C. Sr. H.O. .. 57
Slough. Upton. Sr. H.O. 57
Stafford. Staffordshire Gen. Infy. Jr. H.M.O. 57
Swansea. Jr. H.M.O. 57
Watford. Peace Mem. Sr. H.O. .. 58
Weston-super-Mare Gen. Sr. H.O. .. 58

CHEST AND TUBERCULOSIS
Brompton, S.W.3. H.O.'s 49
London Chest, E.2. H.O.'s 49
North East Met. R.H.B. Reg. .. 50
Plaistow, E.13. H.O. 50
Driffield. Northfield San. Sr. H.O. .. 53
Glasgow. Robroyston. Jr. H.M.O. & Locum Jr. H.M.O. 54
Leicester. Markfield. Sr. H.O. .. 54
Manchester R.H.B. Sr. Reg. .. 55
Orpington, Kent. Sr. H.O. 56
Ibadan, Nigeria. Univ. College Hosp. Sr. Reg. or Reg. 59

DENTAL SURGERY
Hosp. for Sick Child., W.C.1. Reg. 51
Scotland. Western R.H.B. Reg. .. 57

DERMATOLOGY
Birmingham. Skin. Sr. H.O. or H.O. 52
Guildford. St. Luke's. P.-t. Clin. Asst. 54
Scotland. Western R.H.B. Reg. .. 57
Southend-on-Sea Gen. P.-t. Clin. Asst. 57

EAR, NOSE, AND THROAT
Royal National T.N. & E., W. Reg. or Sr. H.O. 50
St. James', S.W.12. Reg. 50
Birmingham & Midland Ear & Throat. H.O. 52
Bradford. Royal Eye & Ear. Sr. H.O. 52
Canterbury. Kent & Canterbury. Sr. H.O. 53
Isleworth. West Middlesex. Sr. Reg. 54
Newcastle United Hosps. H.O. .. 55
Scotland. Western R.H.B. Regs. .. 57
Wolverhampton Royal. Pre-reg. H.O. 58

GERIATRICS
Hornchurch. St. George's. Jr. H.M.O. 54
Manchester R.H.B. Reg. 55
Rochford, Essex. Gen. Sr. H.O. .. 57
South West Met. R.H.B. Cons. .. 48
Wigan & Leigh H.M.C. Jr. H.M.O. .. 58

HÆMATOLOGY
South Africa. Durban Blood Transfusion Service. Med. Director & P.-t. M.O. 49

(continued overleaf)

INFECTIOUS DISEASES
Hendon Isolation, N.W.9. Reg. .. 49

MEDICINE
Connaught, E.17. H.O. 49
St. Leonard's, N.1. Sr. H.O. 51
St. Mary's, W.2. Reg. 50
Aberdeen Gen. Hosps. B.O.M. H.O.'s 51
Beverley. Westwood. H.O. or Sr. H.O. 51
Birmingham R.H.B. Reg. 52
Blackburn & Dist. H.M.C. Reg. .. 52
Bolton Dist. Gen. Sr. H.O. .. 52
Canterbury. Kent & Canterbury. Sr. H.O. 53
Cardiff. Glan Ely. Sr. H.O. 53
Colchester H.M.C. H.O. 53
Douglas. Noble's Isle of Man. H.O. 53
Kirkcaldy. Victoria. H.O. 54
Lancaster. Royal Lancaster Infy. Pre-reg. H.O. 55
Llwynpia, Rhondda. H.O. 55
Purley, Surrey. P.-t. Clin. Asst. .. 56
Reading Area Dept. of Medicine. H.O.'s 56
Scotland. Western R.H.B. Regs. .. 57
Sheffield. Nether Edge. Sr. H.O. .. 57
Southampton Gen. H.O. 57
Canada. Ottawa Civic. Resident. .. 58
Canada. Reddy Mem., Westmount, Montreal. Resident. 58

NEUROSURGERY
Regional Neurosurgical Centre, S.E.18. Sr. H.O. 50
Romford. Oldchurch. Sr. H.O. .. 56

OBSTETRICS AND GYNÆCOLOGY
Forest Gate, E.7. Pre-reg. H.O. .. 49
German, E.8. H.O. 49
Lambeth, S.E.11. H.O. 49
North East Met. R.H.B. Reg. .. 50
Plaistow Maternity, E.13. H.O. .. 50
Beverley. Westwood. H.O. or Sr. H.O. 51
Birmingham. Solihull. Pre-reg. H.O. 51
Bishop Auckland Gen. H.O. 52
Cardiff. Caerphilly & Dist. Miners'. H.O. 53
Dorking Gen. Sr. H.O. 53
Grimsby Group of Hosps. Reg. .. 54
Leeds R.H.B. Reg. 54
Manchester. Crumpsall. Reg. .. 55
Newcastle R.H.B. Reg. 55
Newcastle United Hosps. Sr. H.O. .. 55
Nottingham. Highbury. Locum Sr. H.O. 55
Redhill County. Reg. 56
Rochdale & Dist. H.M.C. Pre-reg. H.O. 56
Scotland. Western R.H.B. Regs. .. 57
Taplow. Canadian Red Cross Mem. Reg. 58
Wakefield. Pinderfields Gen. H.O. .. 58
Windsor. King Edward VII. H.O. .. 58
Northern Ireland Hosps. Auth. P.-t. Cons. 49

OPHTHALMOLOGY
St. James', S.W.12. P.-t. Locum Reg. 51
Bradford. Royal Eye & Ear. H.O. .. 52
Oxford United Hosps. H.O. 56
Scotland. Western R.H.B. Reg. .. 57

ORTHOPÆDICS
Aberdeen Gen. Hosps. B.O.M. H.O.'s 51
Ashford, Middx. H.O. 51
Beverley. Westwood. H.O. 51
Birmingham R.H.B. Reg. 52
Chertsey. St. Peter's. Sr. H.O. or Pre-reg. H.O. 53
Leeds R.H.B. Reg. 54
Manchester R.H.B. P.-t. Cons. .. 48
Manchester R.H.B. Reg. 55
North East Met. R.H.B. Reg. .. 50
Portsmouth Group H.M.C. Pre-reg. H.O. & Locum Sr. H.O. 56
Reading. Battle. H.O. 56
Scotland. South-Eastern R.H.B. Reg. 57
Scotland. Western R.H.B. Reg. .. 57
Stoke-on-Trent. North Staffs Royal Infy. Sr. H.O. 58
Tunbridge Wells. Pembury. Sr. H.O. 58
Wolverhampton Group. Reg. .. 58
Worcester Royal Infy. H.O. 58
New Zealand. Waikato Hosp., Hamilton. Sr. Reg. or Jr. Specialist 49

PÆDIATRICS
Hosp. for Sick Child., W.C.1. Sr. H.O. 51
St. James', S.W.12. Sr. H.O. .. 50
Aylesbury. Stoke Mandeville. H.O. 51
Birmingham United Hosps. H.O. .. 51
Canterbury. Kent & Canterbury. H.O. 53
Glasgow. Royal Hosp. for Sick Child. Jr. H.M.O. 54
Reading. Royal Berks. H.O. 56
Scotland. Western R.H.B. Reg. .. 57
Stoke-on-Trent. City Gen. Sr. H.O. & Pre-reg. H.O. 58
Winchester. Royal Hants County. H.O. 58

PATHOLOGY
Bristol. Cossham/Frenchay H.M.C. Sr. H.O. 52
Glasgow. Northern Hosps. B.O.M. Sr. H.O. 54
Guildford Group H.M.C. Reg. .. 54
Manchester United Hosps. Sr. H.O. 55
Manchester. West Manchester H.M.C. Sr. H.O. 55
Manchester. Withington. Sr. H.O. .. 55
Newcastle R.H.B. Reg. 55
Oxford R.H.B. Reg. 56
Scotland. Western R.H.B. Reg. .. 57
South West Met. R.H.B. Cons. .. 49
South Africa. Durban Blood Transfusion Service. Pathologist .. 49

PHYSICAL MEDICINE
Royal Free, W.C.1. Reg. 50

PLASTIC SURGERY
Broxburn, West Lothian. Bangour Gen. Reg. 52

PSYCHIATRY
Fountain, S.W.17. Sr. Reg. (Research) 49
North East Met. R.H.B. Reg. .. 50
Aberdeen Gen. Hosps. B.O.M. H.O. 51
Bedford. Bromham. Jr. H.M.O. .. 51
Carlisle. Garlands. Sr. H.O. 53
East Anglian R.H.B. Reg. 54
Glasgow. Southern Gen. Sr. H.O. .. 54
Manchester R.H.B. Sr. Regs. .. 55
Newcastle R.H.B. Regs. 55
North East Met. R.H.B. Sr. H.M.O. 48
North West Met. R.H.B. P.-t. Sr. H.M.O. 48
Scotland. Northern R.H.B. Reg. .. 57
Scotland. Western R.H.B. Reg. .. 57
Sheffield. Middlewood. Jr. H.M.O. or Sr. H.O. 57
Sheffield R.H.B. Sr. H.M.O.'s .. 48
South East Met. R.H.B. Cons. .. 48
South Somerset Clinical Area. Cons. 49
South West Met. R.H.B. Sr. H.M.O.'s 48
Welsh R.H.B. Locum Cons. 49
New York. Albany. Residencies .. 58

RADIOLOGY
Ashford, Middx. Sr. Reg. 51
Newcastle R.H.B. Sr. Reg. 55
Scotland. Western R.H.B. Reg. .. 57
Sheffield R.H.B. Sr. H.M.O. 48

RADIOTHERAPY
Sheffield R.H.B. Sr. H.M.O. 48

SURGERY
Charing Cross, W.C.2. P.-t. Cons. .. 48
Dreadnought Seamen's, S.E.10. Pre-reg. H.O.'s 49
Highlands Gen., N.21. H.O. 49
Hosp. for Sick Child., W.C.1. Sr. H.O. 51
London Jewish, E.1. Sr. H.O. .. 50
Mile End, E.1. H.O. 50
National Temperance, N.W.1. H.O.'s 50
Nelson, S.W.20. H.O. 50
Prince of Wales's Gen., N.15. Sr. H.O. 50
South London Hosp. for Women & Child., S.W.4. H.O. 50
South West Met. R.H.B. Cons. .. 48
South Western, S.W.9. Pre-reg. H.O. 50
St. Andrew's, E.3. H.O.'s 51
St. Mark's, E.C.1. Sr. Reg. or Reg. .. 51
St. Mary's Hosp. for Women & Child., E.13. Pre-reg. H.O. 50
St. Mary's, W.2. P.-t. Sr. H.O. .. 50
Wimbledon, S.W.20. H.O. 51
Aberdeen Gen. Hosps. B.O.M. H.O. 51
Aberystwyth. Gen. Sr. H.O. 51
Accrington. Victoria. H.O. 51
Ashford, Middx. H.O. 51
Aylesbury. Royal Bucks. Sr. H.O. & H.O. 51
Barnsley. Beckett. H.O. 51
Barnstaple. North Devon Infy. Pre-reg. H.O. 51
Bedford Gen. H.O. 51
Beverley. Westwood. H.O. 51
Birmingham Accident. H.O.'s .. 52
Bishop Auckland. Gen. H.O. .. 52
Bognor War Mem. Sr. H.O. 52
Bolton Dist. Gen. H.O. 52
Boston. Gen. Reg. 52
Bournemouth. Royal Victoria. H.O. 52
Brighton. New Sussex Hosp. for Women. Locum Sr. H.O. 52
Brighton. Royal Sussex County. Pre-reg. H.O. 52
Bromsgrove Gen. Pre-reg. H.O. .. 52
Burton-on-Trent. Gen. Pre-reg. H.O. 52
Cambridge. Addenbrooke's. H.O. .. 52
Canterbury. Kent & Canterbury. H.O. 53
Cardiff. Caerphilly & Dist. Miners'. H.O.'s 53
Carshalton. St. Helier. H.O. .. 53
Chertsey. St. Peter's. Sr. H.O. or Pre-reg. H.O. 53
Chester-le-Street. Gen. Sr. H.O. .. 53
Chichester. Royal West Sussex. Sr. H.O. 53
Chichester. St. Richard's. Pre-reg. H.O.'s 53
Colchester H.M.C. H.O.'s 53
Crewe & Dist. Mem. Reg. 53
Douglas. Noble's Isle of Man. H.O. 53
Dudley, Stourbridge & Dist. Pre-reg. H.O. 53
East Anglian R.H.B. Sr. Reg. .. 54
Enfield. Chase Farm. Pre-reg. H.O. 53
Guildford. Royal Surrey County. H.O. 54
Hastings. St. Helen's. Pre-reg. H.O. 54
Hull. Kingston Gen. Pre-reg. H.O. 54
Hull. Victoria Hosp. for Sick Child. H.O.'s 54
Huntingdon County. H.O. 54
Kidderminster & Dist. Gen. Pre-reg. H.O. 54
Lancaster. Royal Lancaster Infy. Pre-reg. H.O. 55
Leamington Spa. Warneford Gen. H.O. 54
Leeds. Chapel Allerton. Sr. H.O. .. 54
Leeds R.H.B. Reg. 54
Lincoln County. Pre-reg. H.O. .. 54
Maidenhead. Reg. 55
Maidstone. West Kent Gen. Pre-reg. H.O. 55
Manchester R.H.B. Reg. 55
Newcastle Gen. H.O. 55
Nottingham City. H.O. 56
Oxford R.H.B. Locum Reg. 56
Plymouth. South Devon & East Cornwall. Sr. H.O. 56
Pontypridd. East Glamorgan. H.O. 56
Portsmouth Group H.M.C. Pre-reg. H.O.'s 56
Ramsgate Gen. H.O. 56
Redhill County. Pre-reg. H.O.'s .. 56
Rochdale & Dist. H.M.C. H.O. .. 56
Rochdale Group of Hosps. Pre-reg. H.O.'s 57
Romford. Rush Green. H.O. 56
Romford. Victoria. H.O. 56
Ryde. Royal I.W. County. Pre-reg. H.O. or Sr. H.O. 56
Scotland. Western R.H.B. Sr. Regs. & Regs. 57
Shrewsbury. Royal Salop Infy./Copthorne. H.O. 57
Southampton. Royal South Hants. H.O. 57
Stirling & Clackmannan Hosps. B.O.M. Pre-reg. H.O. 57
St. Helens & Dist. H.M.C. H.O. .. 57
Stoke-on-Trent. City Gen. Pre-reg. H.O. 58
Stoke-on-Trent. North Staffs Royal Infy. Pre-reg. H.O. 58
Swansea. Pre-reg. H.O. 57
Watford. Peace Mem. Pre-reg. H.O. 58
Winchester. Royal Hants County. H.O.'s 58
Worcester. Ronkswood. Sr. H.O. .. 58

THORACIC SURGERY
London Chest, E.2. Sr. H.O. 49
South East Regional Thoracic Surgery Unit, S.E.18. Sr. H.O. 50
Aberdeen Gen. Hosps. B.O.M. H.O.'s 51
Leeds United Hosps./R.H.B. Reg. .. 54
Sheffield R.H.B. P.-t. Cons. 48

UROLOGY
Bristol. Southmead Gen. Hosp. Group M.C. Sr. H.O. 52

VENEREOLOGY
St. Mary's, W.2. Reg. 50

GENERAL
Canada. Reddy Mem., Westmount, Montreal. Jr. Internes. 58
Canada. Regina Gen. Resident & Asst. Resident 58
New York. New Rochelle. Internships 58
U.S.A. Elmhurst Gen., N.Y. Internships & Residencies. 58

PUBLIC APPOINTMENTS 59

GENERAL PRACTICE 60

NON-MEDICAL 60

MISCELLANEOUS 60

The Terms and Conditions of Service of Hospital Medical and Dental Staff apply to all N.H.S. hospital posts we advertise, unless otherwise stated. Canvassing disqualifies, but candidates may normally visit the hospital by appointment.

Academic and Educational

ROYAL COLLEGE OF PHYSICIANS OF LONDON

The next EXAMINATION for the MEMBERSHIP will commence on MONDAY, 18TH MARCH, 1957.

Prospective candidates are asked to note that entries accompanied by the certificates, testimonials and the Examination fee of 15 guineas as required by the by-laws, must reach the College not later than first post on Monday, 18th February, 1957. Candidates must have been qualified for 18 months.

Candidates who propose to submit Published Work under the regulations are required to give 28 days notice, and should apply in writing to the Registrar, without delay, for detailed instructions as to the procedure they should follow. Completed entries for Published Work must also reach the College not later than first post on Monday, 18th February, 1957.

HAROLD BOLDERO, D.M., Registrar.

12, Pall Mall East, London, S.W.1.

ROYAL COLLEGE OF PHYSICIANS OF LONDON

DONALD DARNLEY REID, Esq., M.D., PH.D., will deliver the MILROY LECTURES on TUESDAY, 5TH, and THURSDAY, 7TH FEBRUARY, 1957, at 5 P.M. at the College, Pall Mall East, S.W.1.

Subject: "Environmental Factors in Respiratory Disease."

Any member of the Medical Profession admitted on presentation of card.

By order of the President.

HAROLD BOLDERO, Registrar.

UNIVERSITY OF EDINBURGH
FACULTY OF MEDICINE

LAWRENCE POOLE PRIZE IN REHABILITATION AFTER POLIOMYELITIS

The second award of the above-mentioned Prize from the Fund collected by the Edinburgh Branch of the Infantile Paralysis Fellowship as a Memorial to the late Lawrence N. B. Poole, may be made in 1957, to any student or graduate in the Faculty of Medicine or the Faculty of Science (not necessarily of Edinburgh University), under the following conditions:—

(*a*) as an award to the inventor of any significant equipment of proven value in the rehabilitating of sufferers from poliomyelitis, or in facilitating their mode of life after rehabilitation is complete, or

(*b*) as an award to anyone who devised some form of physical or medical treatment which accelerated the rehabilitation of victims of poliomyelitis, or

(*c*) as a prize to anyone who has made a valuable contribution to the knowledge of the prevention or cure of poliomyelitis, or

(*d*) as a grant for 1, 2 or 3 years to instigate and carry out any approved investigation in the prevention, and/or cure of poliomyelitis.

Applications or nominations for the Prize should be lodged with the Dean of the Faculty of Medicine, University New Buildings, Teviot-row, Edinburgh, 8, by 30th April, 1957, and should give full particulars of the grounds upon which the application or nomination is made.

CHARLES H. STEWART, Secretary to the University.

January, 1957.

UNIVERSITY OF EDINBURGH
FACULTY OF MEDICINE

WILLIAM LESLIE PRIZE IN MEDICINE

The above Prize of the value of £100, may be awarded in 1957, and thereafter annually, on the recommendation of the Faculty of Medicine to a graduate in medicine and surgery of not more than 5 years standing, who has been engaged in medical work in the South-Eastern (Scotland) Area and is not above the grade of Lecturer in the University or Senior Registrar in the Hospital Service, who presents a paper, published or in manuscript, of sufficient merit relating to either clinical or experimental medical investigation. The holder must spend the Prize money on travel to an approved medical centre or centres and subsequently submit a report to the Dean.

WILLIAM LESLIE PRIZE IN SURGERY

The above Prize of the value of £100, may be awarded in 1957, and thereafter annually, on the recommendation of the Faculty of Medicine to a graduate in medicine and surgery of not more than 5 years standing, who has been engaged in surgical work in the South-Eastern (Scotland) Area and is not above the grade of Lecturer in the University or Senior Registrar in the Hospital Service, who presents a paper, published or in manuscript, of sufficient merit relating to either clinical or experimental surgical investigation. The holder must spend the Prize money on travel to an approved surgical centre or centres and subsequently submit a report to the Dean.

Papers are to be lodged with the Dean of the Faculty of Medicine, University New Buildings, Teviot-row, Edinburgh, 8, by 30th April, 1957.

CHARLES H. STEWART, Secretary to the University.

7th January, 1957.

LONDON SCHOOL OF HYGIENE AND TROPICAL MEDICINE
(UNIVERSITY OF LONDON)
Incorporating the Ross Institute
DEPARTMENT OF MEDICAL STATISTICS AND EPIDEMIOLOGY

A COURSE in the APPLICATION OF STATISTICAL METHODS TO MEDICINE AND EPIDEMIOLOGY will be held from 10 A.M. to 3 P.M. on TUESDAYS and THURSDAYS from TUESDAY, 5TH MARCH, to TUESDAY, 25TH JUNE, 1957, inclusive. Students without a medical qualification can be accepted. Details of the syllabus are obtainable on request. The fee for the course is 15 guineas.

Applications for admission must be made before 26th February to the Registrar, London School of Hygiene and Tropical Medicine, Keppel-street (Gower-street), London, W.C.1.

EDINBURGH POST-GRADUATE BOARD FOR MEDICINE

GENERAL SURGERY

3 months courses of post-graduate Surgery suitable for surgeons requiring a refresher course in the current outlook on general surgery or for graduates preparing to specialise in surgery, start on 18TH MARCH and 30TH SEPTEMBER, 1957. The programme has been arranged so as to provide coördinated clinical and systematic instruction in general surgical wards and specialised surgical units in Edinburgh. Fee £31 10s.

MEDICAL SCIENCES

A 3 months course in Applied Anatomy, Physiology, Pathology, Bacteriology, and Biochemistry will begin on 24TH JUNE, 1957. This course includes an adequate amount of practical instruction and is suitable for post-graduates wishing to take the Primary Fellowship examination. Fee £31 10s.

2 courses in the Basic Sciences (Anatomy, Physiology, Pathology, including Bacteriology) are arranged by the Royal College of Surgeons, under the ægis of the Edinburgh Post-Graduate Board for Medicine. These courses comprising lectures, demonstrations, and practical instruction, will begin on 11TH FEBRUARY and 14TH OCTOBER, 1957, and continue for 10 weeks. Fee £26 5s.

The courses in Medical Sciences are designed as a final preparation for the Primary Fellowship examination and it is essential that those attending should already have a considerable knowledge of the subjects.

INTERNAL MEDICINE

Courses lasting 12 weeks, suitable for graduates desiring a refresher course, or to specialise in Medicine, begin on 25TH MARCH and 23RD SEPTEMBER, 1957. These courses consist of 320 hours instruction, comprising lectures, clinical demonstrations, and ward visits. Fee £31 10s.

The Royal College of Physicians of Edinburgh award 2 Hill Pattison-Struthers Bursaries each year to graduates attending the Internal Medicine course. Each Bursary amounts to £100. Applications must be submitted to the Secretary, Royal College of Physicians, Edinburgh, before 1st February, 1957.

Additional instruction in Clinical Pædiatrics and in Tropical Medicine is arranged in conjunction with the course in Medicine. There is a small additional fee and the numbers are limited.

Applications for enrolment should be addressed to the Director of Post-Graduate Studies, Surgeons' Hall, Edinburgh, 8, supplying particulars of qualifications and post-graduate experience.

SHEFFIELD REGIONAL HOSPITAL BOARD

RESEARCH PRIZES

The Board announce that following consideration of the entries received for their Research Prize Competition closing on 1st October, 1956, they have awarded prizes of £50 each to the following:

Dr. A. H. MORRIS, Senior Registrar in Diagnostic Radiology, Leicester Royal Infirmary, for his entry entitled "The Radiological Features of Hodgkin's Disease in the Thorax."

Dr. N. M. GIBBS, Senior Registrar in Clinical Pathology, Derbyshire Royal Infirmary, for his entry entitled "The Problem of Thromboembolism."

L. W. FAULKNER, Secretary to the Board.

Sheffield, 14th January, 1957.

SOCIETY OF APOTHECARIES OF LONDON

DIPLOMA IN INDUSTRIAL HEALTH

The next Examination will begin on MONDAY, 1ST JULY, 1957. The following Examination will be held in December, 1957.

For Regulations apply Registrar, Apothecaries' Hall, Black Friars-lane, London, E.C.4.

THE UNIVERSITY OF MANCHESTER. Applications for the post of LECTURER IN MEDICAL STATISTICS are invited from medical or non-medical graduates. Salary within the range £1000–£1800 p.a. (for medically qualified persons), or £650–£1350 p.a. (for non-medically qualified persons). Initial salary according to qualifications and experience. Membership F.S.S.U. and Children's Allowance Scheme.

Applications should be sent not later than 9th February, 1957, to the Registrar, the University, Manchester, 13, from whom further particulars and forms of application may be obtained.

THE UNIVERSITY OF SHEFFIELD. Applications are invited for a full-time post of LECTURER IN FORENSIC MEDICINE to begin duties as soon as possible. The person appointed will have opportunity to undertake medicolegal work outside the University, and a suitably qualified candidate may be recommended for appointment to an official position with the Sheffield Police Force. A basic training in pathology is essential. Salary scale £1000–£100–£1700, with F.S.S.U. and family allowance. Initial salary according to qualifications and experience.

Further particulars should be obtained from the Registrar, to whom applications (10 copies) should be sent by 23rd February, 1957.

UNIVERSITY OF LEEDS. UNITED LEEDS HOSPITALS. Applications are invited for the post of SENIOR REGISTRAR AND TUTOR IN PSYCHIATRY. The successful candidate will be a member of the University Department of Psychiatry and the duties will include work at the General Infirmary at Leeds with which the University Department is associated and such other duties as may be assigned to him by the Head of the University Department.

Applications (3 copies), stating date of birth, qualifications, and details of present and previous appointments with dates, and experience of teaching, together with the names of 3 referees, should reach the Registrar, The University, Leeds, 2 (from whom further particulars may be obtained), not later than 9th February, 1957.

GUY'S HOSPITAL MEDICAL SCHOOL, S.E.1. Applications are invited for the post of JUNIOR LECTURER IN PHARMACOLOGY at Guy's Hospital Medical School. The appointment will commence as soon as possible until 30th September, 1958, in the first instance. Salary £700–£50–£900 for those holding a medical qualification, or £600–£50–£700 for those non-medically qualified.

Forms of application are obtainable from, and should be lodged with, the Dean, Guy's Hospital Medical School, London Bridge, S.E.1, not later than 7th February.

Hospital Services : Senior Appointments

CHARING CROSS HOSPITAL, W.C.2. Part-time ASSISTANT SURGEON (Consultant), 5 sessions per week. Applicants should be General Surgeons with special training and experience in genito-urinary surgery.

Candidates, who must be Fellows of the Royal College of Surgeons of England, should submit 12 typewritten copies of their applications, stating date of birth, qualifications, and experience, and the names of 3 referees to reach the undersigned by 23rd February, 1957. FRANK HART, Secretary to the Board.

NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for the post of ASSISTANT SENIOR MEDICAL OFFICER at a salary scale of £1680–£80(4)–£100(1)–£2100, plus £50 London weighting. The work will be to assist the Board's Senior Administrative Medical Officer in the medical administration of the Hospital and Specialist Services of the Region and to carry out such duties as are assigned by him. Candidates must be well qualified and should have had hospital and administrative experience in a senior capacity. The appointment will be whole-time and subject to the approved Whitley Council conditions.

Applications, stating age, qualifications and experience, with the names of 3 referees, to the Secretary, North West Metropolitan Regional Hospital Board, 11A, Portland-place, W.1, by 1st February, 1957.

NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD.

(1) CHILD PSYCHIATRIST (4 half-days a week), Senior Hospital Medical Officer grade, Bedfordshire Child Guidance Service. Duties in northern part of the County based on the Clinic at 3, St. Peter's-street, Bedford. May be visited by arrangement with the County Medical Officer, Bedfordshire County Council, Phoenix Chambers, High-street, Bedford.

Applications before 4th March, 1957.

(2) CONSULTANT ANÆSTHETIST (3 half-days a week), King Edward Memorial Hospital, Ealing, W.13 (151 Beds). Operating sessions Monday mornings and Tuesday afternoons, and at Clayponds Wing on Wednesday mornings. Hospital may be visited by direct appointment.

Applications before 6th March, 1957.

Application forms obtainable from, and returnable to, Secretary, North West Metropolitan Regional Hospital Board, 11A, Portland-place, W.1.

SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD requires CONSULTANT SURGEON (whole-time or maximum part-time) in the Chelsea Group of hospitals, for duties at St. Stephen's Hospital, Fulham-road, London, S.W.10. The work will involve an equal share in all the general surgery and traumatic surgery with the existing Consultant Surgeon. Applicants must possess the F.R.C.S., and have wide experience in general surgery. Post vacant on 3rd July, 1957.

Applications by letter (5 copies), giving date of birth, qualifications, experience, and names of 3 referees, to Secretary (S.1), South West Metropolitan Regional Hospital Board, 11A, Portland-place, London, W.1, by 23rd February, 1957. Applicants may visit Hospital by local arrangement.

MANCHESTER REGIONAL HOSPITAL BOARD. Additional Part-time (8 half-days weekly) CONSULTANT TRAUMATIC AND ORTHOPÆDIC SURGEON to the Ashton, Hyde and Glossop Hospital Centre (mainly at Ashton-under-Lyne General Hospital, near Manchester, 640 Beds). Wide experience and higher qualifications essential; appointee to live in area.

Application forms from the Senior Administrative Medical Officer to the Board, Cheetwood-road, Manchester, 8, to be returned by 12th February, 1957.

NEWCASTLE REGIONAL HOSPITAL BOARD. Consultant ANÆSTHETIST, whole-time, or part-time for a minimum of 9 notional half-days per week, for Darlington Group of hospitals. Main hospital, Darlington Memorial (307 Beds).

Applications, with names and addresses of 3 referees, to Senior Administrative Medical Officer, Regional Hospital Board, Benfield-road, Newcastle upon Tyne, 6, within 28 days.

NEWCASTLE REGIONAL HOSPITAL BOARD. Special AREA COMMITTEE FOR CUMBERLAND AND NORTH WESTMORLAND. Whole-time SENIOR CASUALTY OFFICER required for West Cumberland Group of hospitals. Main hospitals: Whitehaven Hospital (124 Beds) and Workington Infirmary (118 Beds). To work under general supervision of 1 or more Consultant Surgeons and 1 or more Consultant Orthopædic Surgeons: based at Whitehaven Hospital with duties in other hospitals. Appointment for a period not exceeding 4 years: commencing salary within the scale £1575–£2025 p.a.

Applications, with names and addresses of 3 referees, to Senior Administrative Medical Officer, 72, Warwick-road, Carlisle, within 28 days.

NORTH EAST METROPOLITAN REGIONAL HOSPITAL BOARD. Full-time ASSISTANT PSYCHIATRIST (Senior Hospital Medical Officer grade) at South Ockendon Group of hospitals, Essex; experienced in mental deficiency. Normally non-resident but staff cottage available.

Applications (6 copies), and names of 3 referees, should reach the Secretary, 11A, Portland-place, London, W.1, by Saturday, 16th February, 1957.

SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time SENIOR ASSISTANT PSYCHIATRIST required for Carlton Hayes Hospital, Narborough, Leicester. Accommodation in small house or other married or single quarters available. Salary £1575–£50–£2025.

Application forms and further details from Senior Administrative Medical Officer, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield. Forms to be returned by 16th February, 1957.

SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time ASSISTANT RADIOTHERAPIST for the Sheffield National Centre for Radiotherapy. Candidates should be in possession of the D.M.R.(T.). The successful applicant will work under the direction of the Medical Director. Salary scale £1575–£50–£2025.

Application forms and further details from the Senior Administrative Medical Officer, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield. Forms to be returned by 16th February, 1957.

SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time SENIOR ASSISTANT PSYCHIATRIST required for Middlewood Hospital, Sheffield. Salary scale £1575–£50–£2025.

Application forms and further details from Senior Administrative Medical Officer, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield. Forms to be returned by 23rd February, 1957.

SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time ASSISTANT RADIOLOGIST (Senior Hospital Medical Officer grade) required for the Nottingham General Hospital. Successful candidate will work under the direction of the Consultant-in-charge and will be required to undertake occasional sessions at other hospitals in the Nottingham area. Salary scale £1575–£50–£2025.

Application forms and further details from Senior Administrative Medical Officer, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield. Forms to be returned by 23rd February, 1957.

SHEFFIELD REGIONAL HOSPITAL BOARD. Consultant THORACIC SURGEON (maximum part-time) required. Main duties at Nottingham City Hospital with duties at other hospitals in the area.

Application forms and further details from Senior Administrative Medical Officer, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, 10. Forms to be returned by 23rd February, 1957.

SOUTH EAST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited to fill a vacancy for a Whole-time CONSULTANT PSYCHIATRIST to the St. Francis and Lady Chichester Group of hospitals, for duty at St. Francis Hospital, Haywards Heath, Sussex, incorporating Hurstwood Park Hospital where there is a Neuropsychiatric Unit. The successful applicant will be required to reside within reasonable distance of the Hospital. Candidates should possess a D.P.M. and preferably a higher qualification; psychiatric hospital and outpatient clinic experience is essential, and candidates should have had experience in modern psychiatric therapeutic procedures, including psychotherapy and occupational therapy. Applicants may visit the Hospital.

Apply, stating nationality, age, sex, qualifications and experience, including details of present appointment and of war service, together with the names and addresses of 3 referees, to the Secretary, Advisory Appointments Committee, South East Metropolitan Regional Hospital Board, 11, Portland-place, W.1, not later than 9th February, 1957.

SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD requires a Whole-time CONSULTANT PHYSICIAN in Geriatrics to the Southampton Group of hospitals. Candidates should have wide experience and possession of higher qualifications would be an advantage. The person appointed will be in charge of a Geriatric Department consisting of an Admission Unit of 55 Beds in the Southampton General Hospital, and 310 "long-stay" beds in other hospitals in the Group. He will also be required to undertake the domiciliary assessment of patients on the waiting-list and maintain close liaison with the General Practitioners and the Local Health Authorities. Residence in or within a radius of 10 miles of Southampton is a condition of the appointment. Canvassing will disqualify but candidates may visit the hospitals concerned by arrangement with the Group Secretary, Bullar-street, Southampton.

Applications (7 copies), stating age, qualifications and experience, and the names and addresses of 3 referees, to the Area Secretary, "Highcroft," Romsey-road, Winchester, by 16th February.

SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD requires Whole-time ASSISTANT PSYCHIATRIST (Senior Hospital Medical Officer grade) at Brookwood Hospital, Knaphill, Woking, Surrey. Candidates should have good psychiatric experience and possess D.P.M. The post is non-resident.

Applications by letter (5 copies), giving date of birth, qualifications, experience, and names of 3 referees, to Secretary (S.1), South West Metropolitan Regional Hospital Board, 11A, Portland-place, W.1, by 16th February, 1957. Applicants may visit Hospital by local arrangement.

SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD requires Whole-time (non-resident) ASSISTANT PSYCHIATRIST (Senior Hospital Medical Officer grade) for the Royal Earlswood Group of (M.D.) Hospitals (1000 Beds approximately). Candidates should possess D.P.M. and preferably have some experience of child psychiatry. Successful candidate required to live within reasonable distance of the Forest Hospital, Horsham.

Applications by letter (5 copies), giving date of birth, qualifications, experience, and names of 3 referees, to Secretary (S.1), South West Metropolitan Regional Hospital Board, 11A, Portland-place, London, W.1, by 16th February, 1957. Applicants may visit hospitals by local arrangement.

SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD requires a CONSULTANT PATHOLOGIST (whole-time or maximum part-time) for general pathological duties in the Bournemouth and East Dorset Group of hospitals. The successful candidate's main duties will be at the Poole General Hospital, but he will be required to work at various hospitals in the Group. Residence in the Bournemouth and Poole area is a condition of the appointment. Canvassing will disqualify but candidates may visit the hospitals by arrangement with the Group Secretary, Royal Victoria Hospital, Shelley-road, Boscombe, Bournemouth.

Applications (7 copies), stating age, qualifications and experience, and the names and addresses of 3 referees, to the Area Secretary, "Highcroft," Romsey-road, Winchester, by 16th February.

SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD requires a CONSULTANT ANÆSTHETIST for 9 half-days per week for the Salisbury Group of hospitals. Candidates should possess higher qualifications, and residence in or within a 10 mile radius of Salisbury is a condition of the appointment. Canvassing will disqualify but applicants may visit the hospitals concerned by arrangement with the Group Secretary, Odstock Hospital, Salisbury.

Applications (7 copies), stating age, qualifications and experience, and the names and addresses of 3 referees, to the Area Secretary, "Highcroft," Romsey-road, Winchester, by 16th February.

SOUTH SOMERSET CLINICAL AREA. Tone Vale HOSPITAL, near TAUNTON. SOUTH-WESTERN REGIONAL HOSPITAL BOARD. Applications are invited for the appointment of Whole-time CONSULTANT PSYCHIATRIST to the South Somerset Clinical Area. Applicants should possess the D.P.M. and a higher qualification in medicine. The successful candidate will work mainly at Tone Vale Hospital, and act as Deputy to the Medical Superintendent; in addition, he will be required to visit other hospitals in the Clinical Area as determined by the Regional Board from time to time. A modern detached house will be available.

Applications (12 copies), stating date of birth, qualifications and experience, together with the names and addresses of 2 referees, should be sent to the Secretary of the Regional Hospital Board, 27, Tyndalls Park-road, Bristol, 8, not later than 16th February, 1957.

NORTHERN IRELAND HOSPITALS AUTHORITY. Applications are invited for a post as CONSULTANT OBSTETRICIAN AND GYNÆCOLOGIST at hospitals managed by East Antrim Hospital Management Committee. The appointment will be on a part-time basis of 7 half-days of duty weekly and the terms and conditions will be in accordance with the Authority's application of the Spens report to Northern Ireland.

Applications to be made on a form obtainable (with further particulars) from the Secretary, Northern Ireland Hospitals Authority, 44–46, Queen-street, Belfast, and to be returned not later than 9th February, 1957.

NEW ZEALAND. WAIKATO HOSPITAL, Hamilton, NEW ZEALAND. Applications are invited from suitably qualified medical practitioners of the British Empire for the position of Full-time ORTHOPÆDIC SURGEON at the above Hospital. Preference will be given to applicants possessing postgraduate degrees.

Salary in accordance with the Hospital Employment (Medical Officers) Regulations as either :—

(*a*) Senior Registrar £N.Z.970–£N.Z.1130 plus an allowance of £N.Z.200 in lieu of residence or :—

(*b*) Junior Specialist £N.Z.1600–£N.Z.1900 (non-resident).

An allowance will be paid on arrival, towards travelling expenses incurred, in travelling to take up appointment.

Conditions of appointment and form of application are available from the Office of the High Commissioner for New Zealand, 415, Strand, London, W.C.2. Applications close with the Secretary, P.O. Box 934, Hamilton, New Zealand, Thursday, 18th April, 1957. A. C. BURGESS, Secretary.

SOUTH AFRICA. DURBAN BLOOD TRANSFUSION SERVICE. Applications are invited from registered medical practitioners for the following appointments :—

MEDICAL DIRECTOR.

The inclusive emoluments of this post are £2640 p.a. and the post is not pensionable. The holder of this post will be responsible to the Committee of the Durban Blood Transfusion Service for over-all control of the Service. He should have a practical experience in the running of a blood grouping and blood processing laboratory together with administrative experience in blood bank organisation. It is desirable that the incumbent be a registered Specialist.

PATHOLOGIST.

The inclusive emoluments of this post will be of the order of £2000 p.a., depending on experience, and the post is not pensionable. Applicants should preferably be registered Specialists in pathology and the duties will consist of the laboratory control of the Blood Transfusion Service.

Part-time MEDICAL OFFICER.

The emoluments of this post will be up to £1800 p.a., dependent on experience and the proportion of time devoted to the Service. The duties consist primarily of the medical examination and bleeding of donors, both in Durban and with the Service's mobile unit.

For the information of intending applicants who are resident outside the Union of South Africa, income taxes presently payable in the Union on the above scales of remuneration are :—

Emoluments	*Married (no children)*	*Single*
£2640	£310	£376
£2000	£161	£210
£1800	£139	£171

Applications, giving full details of experience and qualifications, should be addressed to the Chairman of the Durban Blood Transfusion Service, P.O. Box 2324, Durban, on or before 15th February, 1957.

WELSH REGIONAL HOSPITAL BOARD. Whole-time Locum Tenens CONSULTANT PSYCHIATRIST required Morgannwg Hospital, Bridgend, immediately for approximately 3 months.

Applications, naming 2 referees, to Senior Administrative Medical Officer, Temple of Peace, Cathays Park, Cardiff.

Hospital Services : Junior Appointments

BROMPTON HOSPITAL, S.W.3. Applications invited for the post of NON-RESIDENT HOUSE PHYSICIAN for which there are 3 vacancies, for 6 months from 1st April, 1957. Duties include work in Outpatient Department and wards. Salary at the rate of £525 p.a.

Applications, stating age, qualifications with dates, nationality, and appointments held, together with copies of testimonials, by 9th February, 1957, to—

KENNETH A. F. MILES, House Governor.

CONNAUGHT HOSPITAL, Walthamstow, E.17. (118 Beds.) HOUSE PHYSICIAN required for a period of 6 months. Post vacant 1st March, 1957.

Applications, with full details and copies of 2 recent testimonials, should be sent immediately to the Secretary, Hospital Management Committee, Forest Group, Langthorne-road, E.11.

DREADNOUGHT SEAMEN'S HOSPITAL, Greenwich, S.E.10. 2 HOUSE SURGEONS (pre-registration) required on 2nd and 16th February, 1957.

Applications, stating age, nationality, qualifications and experience, and giving the names of 3 recent referees, should be sent to the Secretary as soon as possible and in any event not later than 30th January.

FOREST GATE HOSPITAL, Forest-lane, E.7. Pre-registration OBSTETRIC HOUSE OFFICER (second post) required for 6 months commencing 1st March, 1957. The appointment is recognised for training candidates for D.Obst.R.C.O.G.

Applications, with names of 2 referees, to Hospital Secretary by 2nd February, 1957.

FOUNTAIN HOSPITAL, Tooting-grove, London, S.W.17. SENIOR REGISTRAR required for a 3-year appointment for clinical research at the Fountain Hospital for mentally defective children. Candidates should have an interest in pædiatrics or neuropsychiatry and some experience of research methods. Applicants may visit the Fountain Hospital or obtain further information by writing.

Application forms from the Group Secretary.

GERMAN HOSPITAL, London, E.8. (General—157 Beds.) Applications for the 6 months resident appointment, vacant 19th February, of HOUSE SURGEON (obstetrics and gynæcology) (registered candidates only) should reach the Group Secretary, Hackney Hospital, London, E.9, by 1st February, quoting GH/HSO.

HENDON ISOLATION HOSPITAL, Goldsmith-avenue, Hendon, London, N.W.9. (112 Beds.) **NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD.** Whole-time MEDICAL REGISTRAR required at above Hospital. Good experience in general medicine desirable with interest in communicable diseases. Will be required to give some assistance in the Poliomyelitis Research Unit. The Hospital may be visited by direct appointment with the Physician-in-charge. In addition, the successful candidate will have charge of 10 beds, under the supervision of a Medical Consultant, at Edgware General Hospital.

Application forms obtainable from, and returnable to, Group Secretary, Edgware General Hospital, Edgware, Middlesex, by 5th February, 1957.

HIGHLANDS GENERAL HOSPITAL, Winchmore Hill, N.21. HOUSE SURGEON required. Duties mainly orthopædic with some E.N.T. and emergency general surgery. New operating theatre, Outpatient and Casualty Department. Post recognised for Pre-registration Service.

Applications, with copies of 3 testimonials, and name and address of 1 referee, to Hospital Secretary.

LAMBETH HOSPITAL, Brook-drive, S.E.11. Applications are invited from pre-registration and registered medical practitioners for the position of RESIDENT HOUSE SURGEON in the Obstetric and Gynæcological Unit. The appointment is for 6 months from 1st March, 1957. The Hospital is recognised for the M.R.C.O.G. and D.Obst.R.C.O.G.

Application forms from the Physician-Superintendent. Stamped addressed envelope should be enclosed.

LONDON CHEST HOSPITAL. Hospitals for Diseases of THE CHEST. A vacancy occurs 1st April, 1957, for RESIDENT HOUSE SURGEON at the Hospital's Country Branch, near Hitchin and Letchworth, Herts. The post is graded as Senior House Officer and the appointment, which provides excellent opportunities for experience in thoracic surgery, is for 6 months.

Applications from registered medical practitioners, stating date of birth, qualifications with dates, and previous appointments held, with copies of 3 testimonials, should reach the undersigned not later than 12th February.

THOMAS BROWN, House Governor.

London Chest Hospital, E.2.

LONDON CHEST HOSPITAL. Hospitals for Diseases of THE CHEST. 2 vacancies occur 1st April, 1957, for RESIDENT HOUSE PHYSICIAN. Appointment for 6 months, 4 in London, 2 at the Country Branch, near Letchworth, and post graded as House Officer. Duties include the Outpatient Department and refill clinic as well as wards.

Applications, stating date of birth, qualifications with dates, and previous appointments held, with copies of 3 testimonials, should reach the undersigned not later than 12th February.

THOMAS BROWN, House Governor.

London Chest Hospital, E.2.

LONDON JEWISH HOSPITAL, Stepney Green, E.1. (130 Beds.) Applications are invited for the post of RESIDENT SENIOR HOUSE OFFICER (Surgical Department). Post vacant immediately. Salary, &c., in accordance with national scale.

Applications, with copies of testimonials, to be sent to the Hospital Secretary.

MEMORIAL HOSPITAL, Shooters Hill, Woolwich, S.E.18. SENIOR HOUSE OFFICER (Casualty Department), vacant 8th February. Recognised for F.R.C.S. 6 months resident appointment and may then be renewed. Salary £745 p.a., less £150 p.a. for residence.

Apply to Secretary.

MILE END HOSPITAL, Bancroft-road, London, E.1. (484 Beds.) HOUSE SURGEON (pre- or post-registration). Post vacant 22nd February, 1957.

Application forms obtainable from Physician-Superintendent, should be returned by 8th February, with copies of not more than 3 testimonials.

NATIONAL TEMPERANCE HOSPITAL, Hampstead-road, N.W.1. (158 Beds.) Applications are invited to fill the posts of 2 HOUSE SURGEONS (general), pre-registration posts. Applications by post-registration candidates will also be considered.

Applications, stating age, qualifications and experience, together with names and addresses of 2 referees, to Hospital Secretary by 2nd February.

NELSON HOSPITAL, Kingston-road, Merton, S.W.20. HOUSE SURGEON (resident) vacant now. Post recognised for F.R.C.S.

Applications, stating age, qualifications, &c., with names and addresses of 2 referees, should be sent to Secretary at above address.

NORTH EAST METROPOLITAN REGIONAL HOSPITAL BOARD.

REGISTRAR in Thoracic Medicine (non-resident), East Ham Chest Clinic, E.7. Candidates must have experience in general medicine and diseases of the chest. Duties include outpatient work at the chest clinic and inpatient work at Plaistow Hospital Chest Unit. The appointment offers excellent opportunities in all aspects of thoracic medicine and good facilities for research.

ANÆSTHETIC REGISTRAR (non-resident), North Middlesex Hospital and Annexes, Edmonton, N.18. Appointment offers wide experience in Anæsthetics and is recognised for D.A. and F.F.A.R.C.S.

REGISTRAR in Obstetrics and Gynæcology (non-resident), North Middlesex Hospital and Annexes, Edmonton, N.18.

PSYCHIATRIC REGISTRAR (resident or non-resident), St. Clement's Hospital, Bow, E.3. Post vacant 1st April, 1957. Duties in Psychiatric Unit of 24 observation beds and 36 beds for treatment of neuroses and early psychoses. The Unit is run in conjunction with the London and Claybury Hospitals and is recognised for the D.P.M.

ORTHOPÆDIC REGISTRAR (resident), St. Andrew's Hospital, Billericay, Essex. Recognised for F.R.C.S.

Appointments subject to review after 1 year.

Application forms from Secretary, 11A, Portland-place, W.1, to be returned by 9th February, 1957.

PLAISTOW HOSPITAL, Samson-street, London, E.13. (185 Beds.) Applications are invited for the appointment of RESIDENT HOUSE OFFICER (post-registration or pre-registration second post) for 6 months commencing 1st April, in the Chest Unit and Infectious Diseases Unit. Some experience in diseases of the chest desirable. The position offers good opportunities for experience in general medicine.

Applications, with copies of recent testimonials, to Hospital Secretary by 6th February.

PLAISTOW MATERNITY HOSPITAL, Howards-road, Plaistow, London, E.13. RESIDENT OBSTETRIC OFFICER (House Officer post-registration) required for 6 months commencing 1st April, 1957.

Apply to Hospital Secretary, not later than 31st January, enclosing copies of 2 recent testimonials.

PRINCE OF WALES'S GENERAL HOSPITAL, N.15. Applications are invited from registered medical practitioners for the appointment of RESIDENT HOUSE SURGEON (Senior House Officer) to Orthopædic, Casualty, and E.N.T. Departments at the above Hospital for a period of 6 months, vacant 24th February, 1957.

Application form from Group Secretary, Tottenham Group Hospital Management Committee, The Green, N.15, to be returned by 2nd February, 1957.

PRINCESS BEATRICE HOSPITAL, Earls Court, London, S.W.5. Applications are invited from registered medical practitioners for the post of CASUALTY OFFICER (some anæsthetic duties). Senior House Officer grade. Recognised for F.R.C.S.

Applications, stating age, qualifications, with 3 testimonials, to the House Governor, not later than Thursday, 7th February, 1957.

REGIONAL NEUROSURGICAL CENTRE. (66 Beds.) BROOK GENERAL HOSPITAL, Shooters Hill-road, S.E.18. SENIOR HOUSE OFFICER (neurosurgery), vacant early February. Post recognised for F.R.C.S. and D.P.M. and provides excellent opportunity for training in neurology.

Apply to Group Secretary, Memorial Hospital, Woolwich, S.E.18.

ROYAL FREE HOSPITAL. Applications are invited from registered medical practitioners for the appointment of REGISTRAR to the Department of Physical Medicine and Rheumatology. The appointment is full time, non-resident for 1 year in the first instant, duties to commence 1st March, 1957. Salary and conditions of service in accordance with those laid down by the Ministry of Health for Registrars.

Application forms may be obtained from the Hospital Secretary, Royal Free Hospital, Gray's Inn-road, W.C.1, to whom they should be returned not later than 7th February.

ROYAL FREE HOSPITAL. Applications are invited from registered medical practitioners for the post of SENIOR CASUALTY OFFICER at the Royal Free Hospital, Gray's Inn-road, W.C.1. The appointment is full-time, resident, for 6 months; duties to commence 1st April, 1957. Salary and conditions of service in accordance with the scale laid down by the Ministry of Health for Senior House Officers.

Application forms may be obtained from the Hospital Secretary, Royal Free Hospital, Gray's Inn-road, W.C.1, to whom they should be returned not later than 28th February, 1957.

ROYAL NATIONAL THROAT, NOSE AND EAR HOSPITAL, Gray's Inn-road, W.C.1, and Golden-square, W.1, in association with the Institute of Laryngology and Otology. Applications are invited for a post of REGISTRAR or alternatively SENIOR HOUSE OFFICER. A higher surgical qualification is required for the former grading and at least the Primary F.R.C.S. for the latter. Considerable clinical experience in general surgery and in this Specialty is required for either post. The appointment will be in accordance with the terms and conditions of service for the appropriate grade in the National Health Service.

Applications, giving full information and the names of 2 referees, should be sent to the House Governor by 8th February, 1957.

SOUTH LONDON HOSPITAL FOR WOMEN AND CHILDREN, Clapham Common, S.W.4. Applications are invited from pre-registration and registered Female medical practitioners for the appointment of HOUSE SURGEON, vacant shortly for a period of 6 months, recognised for the F.R.C.S.

Forms of application from the Secretary.

SOUTH EAST REGIONAL THORACIC SURGERY UNIT. (50 Beds.) BROOK GENERAL HOSPITAL, Shooters Hill-road, S.E.18. SENIOR HOUSE OFFICER, vacant 15th February. Recognised for F.R.C.S. 6 months appointment and may then be renewed for a further period. The Unit treats all types of chest diseases and offers opportunity for comprehensive training in thoracic surgery.

Apply to Group Secretary, Memorial Hospital, Woolwich, S.E.18.

SOUTH WESTERN HOSPITAL, Landor-road, S.W.9. LAMBETH GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited (preferably from Women candidates) for the post of HOUSE SURGEON (pre-registration) at the above Hospital. Duties include general surgery and the successful applicant will also be required to provide relief for leave of the House Surgeon at the Annie McCall Maternity Hospital.

Application forms can be obtained from the Secretary.

ST. MARY'S HOSPITAL, Paddington, W.2. Applications are invited from suitably qualified Male candidates for the post of Whole-time REGISTRAR in the Venereal Diseases Department. The appointment, which is eminently suitable for persons reading for a higher qualification, is for a first period of 12 months as from a date to be arranged, the holder being eligible for re-election.

Applications, stating nationality, date of birth, qualifications, details of experience, together with dates and National Health Service gradings of previous and present appointments and names and addresses of 3 referees, should reach, ALAN POWDITCH, House Governor, not later than 12th February, 1957.

ST. MARY'S HOSPITAL, Paddington, W.2. Applications are invited for the post of Whole-time REGISTRAR in the Allergy Clinics (Wright Fleming Institute of Microbiology). Preference will be given to candidates with previous experience in this specialty. The appointment is for a first period of 12 months as from 1st March, 1957; remuneration to be at Registrar rates.

Applications, stating nationality, date of birth, permanent address, qualifications with dates, details and National Health Service gradings of previous and present appointments, together with the names and addresses of 3 referees, should reach ALAN POWDITCH, House Governor, not later than 5th February, 1957.

ST. MARY'S HOSPITAL, W.2. Applications are invited for the post of Part-time OUTPATIENT SURGICAL ASSISTANT for 4 notional half-days per week (graded Senior House Officer). Candidates should state days on which they are free to work at St. Mary's. This appointment is designed for Men or Women who have already passed their Primary F.R.C.S., and is ideally suited to those reading for the Final as a large number of clinical cases are available; it will be for a first period of 12 months as from a date to be arranged.

Applications, stating nationality, date of birth, permanent address, qualifications with dates, details and National Health Service gradings of previous and present appointments, together with the names and addresses of 3 referees, should reach ALAN POWDITCH, House Governor, not later than 5th February, 1957.

ST. MARY'S HOSPITAL FOR WOMEN AND CHILDREN, Upper-road, Plaistow, London, E.13. HOUSE SURGEON (pre-registration first or second post) to commence 3rd March, 1957.

Apply to Hospital Secretary not later than 31st January, 1957.

ST. JAMES' HOSPITAL, Balham, S.W.12. Senior House OFFICER (pædiatric) with at least 6 months pædiatric experience required immediately. Post recognised for D.C.H. The holder of the post will also be required to assist in the Department of Pathology.

Applications, stating age, experience, qualifications, and names of 2 referees, to Group Secretary, Wandsworth Hospital Group, at above address by 2nd February. (0136.)

ST. JAMES' HOSPITAL, Balham, S.W.12. South West METROPOLITAN REGIONAL HOSPITAL BOARD. REGISTRAR (E.N.T.), resident, post vacant 1st April.

Application forms, obtainable from Group Secretary, Wandsworth Hospital Group, at above address, to be completed and returned by 9th February. (0132.)

ST. JAMES' HOSPITAL, Balham, S.W.12. Locum REGISTRAR (part-time) in Ophthalmology, 7 sessions per week, required from 18th February to 20th April.

Applications, giving full details and names of 2 referees, to Group Secretary at above address immediately. (0139.)

ST. LEONARD'S HOSPITAL, Nuttall-street, N.1. (Acute General—192 Beds.) Applications are invited for the post of SENIOR HOUSE OFFICER in General Medicine. The appointment is for 12 months.

Applications, with 2 testimonials, to the Hospital Secretary by 2nd February.

ST. MARK'S HOSPITAL, City-road, London, E.C.1. Applications invited from Senior Registrars who have completed their training or Registrars who have completed their appointments for the post of RESIDENT SURGICAL OFFICER. Part of time non-resident by arrangement. Salary at the rate of £1400 or £965 respectively. Appointment tenable for 6 months from 1st April with possibility further extension 6 months.

Applications, stating age, qualifications, experience, names of 2 referees, to Secretary, Board of Governors, The Hammersmith, West London and St. Mark's Hospitals, Ducane-road, London, W.12, by 9th February.

ST. ANDREW'S HOSPITAL, Bow, E.3. House Surgeons (2). Recognised pre-registration appointments, commencing 15th and 16th February, 1957.

Applications, with copy of at least 1 testimonial, should be sent to Hospital Secretary immediately.

THE HOSPITAL FOR SICK CHILDREN, Great Ormond-street, London, W.C.1. There is a vacancy for an ORTHODONTIC REGISTRAR to the Dental Department (grade—Registrar). The appointment is full-time and non-resident.

Further particulars and form of application, which must be returned not later than Monday, 4th March, 1957, are obtainable from the undersigned.

H. F. RUTHERFORD, House Governor and Secretary.

THE HOSPITAL FOR SICK CHILDREN, Great Ormond-street, London, W.C.1. There will be a vacancy on 14th May, 1957, for a RESIDENT ANÆSTHETIST (Registrar grade) for duty primarily at the Country Branch Hospital, Tadworth, Surrey.

Full particulars and form of application, which must be returned not later than 4th March, 1957, are obtainable from the undersigned.

H. F. RUTHERFORD, House Governor and Secretary.

THE HOSPITAL FOR SICK CHILDREN, Great Ormond-street, London, W.C.1. There will be vacancies for the following Senior House Officers :—

1 HOUSE PHYSICIAN, on 15th May, 1957.
1 HOUSE SURGEON to the Orthopædic and Plastic Departments, on 15th May, 1957.

Further particulars and form of application, which must be returned not later than 4th March, 1957, are obtainable from the undersigned.

H. F. RUTHERFORD, House Governor and Secretary.

WIMBLEDON HOSPITAL, Thurstan-road, Copse Hill, S.W.20. RESIDENT HOUSE SURGEON (not pre-registration), vacant now. Salary £525.

Applications, giving age, qualifications, &c., with names and addresses of 2 referees, to the Secretary at above address.

ABERDEEN GENERAL HOSPITALS BOARD OF MANAGEMENT. Applications are invited from fully or provisionally registered practitioners for the following House Officer appointments for a period of 6 months from 1st February to 31st July, 1957. A certain number of these appointments may be made in the grade of Senior House Officer, dependent on the qualifications and experience of the applicant. For provisionally registered practitioners, the appointments are approved as Pre-registration Service posts.

Aberdeen Royal Infirmary

2 HOUSE SURGEONS for orthopædic wards (resident).
HOUSE PHYSICIAN for skin, radium and dental ward (resident).
HOUSE PHYSICIAN in the Department of Psychological Medicine (resident).
HOUSE PHYSICIAN in the Outpatients (Skin and V.D.) Department (non-resident).

Woodend General Hospital

2 HOUSE SURGEONS for orthopædic wards (resident).
1 HOUSE SURGEON for general surgery ward (resident).
2 HOUSE SURGEONS for thoracic surgery wards (resident).

Salary and conditions of service in accordance with the terms issued by the Department of Health for Scotland.

Applications, with full details and giving names of 2 referees, should be lodged immediately with the Secretary, Aberdeen General Hospitals, P.O. Box No. 92, 62, Queen's-road, Aberdeen.

ABERYSTWYTH, CARDIGANSHIRE. GENERAL HOS-PITAL. SENIOR HOUSE OFFICER required from 1st February, 1957 (surgical). Post recognised for F.R.C.S. Resident.

Applications, stating age and experience, &c., to the Group Secretary, Mid-Wales Hospital Management Committee, 31, North-parade, Aberystwyth, Cards.

ACCRINGTON. VICTORIA HOSPITAL. (114 Beds.) BLACKBURN AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. HOUSE SURGEON required for 8th February, 1957. Post recognised for F.R.C.S. and approved for pre-registration purposes.

Applications to Group Secretary, Hospital Management Committee Office, Royal Infirmary, Blackburn, Lancs.

ASHFORD HOSPITAL, Ashford, Middlesex. (560 Beds.) STAINES GROUP HOSPITAL MANAGEMENT COMMITTEE. Required, RESIDENT HOUSE OFFICER (Male) for general surgical and medical duties. 6 months appointment, not suitable for pre-registration candidates.

Applications, stating age, qualifications and experience, with copies of up to 3 recent testimonials, to Medical Director of Hospital immediately.

ASHFORD HOSPITAL, Ashford, Middlesex. Staines GROUP HOSPITAL MANAGEMENT COMMITTEE. Required, RESIDENT HOUSE SURGEON (Male) for Traumatic and Orthopædic Unit. 6 months appointment, suitable for pre-registration candidates.

Applications, stating age, qualifications, and experience, with copies of up to 3 recent testimonials, to Medical Director of Hospital, immediately.

ASHFORD HOSPITAL, Ashford, Middlesex. (600 Beds.) NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. SENIOR REGISTRAR in Radiology (whole-time, non-resident) required at above Hospital. Possession of a radiological qualification essential. Successful candidate required to work part-time at another hospital in the Group. Post vacant 1st April, 1957. Hospital may be visited by direct appointment with Medical Director.

Application forms obtainable from, and returnable to, Secretary, Staines Group Hospital Management Committee, Ashford Hospital, Ashford, Middlesex, by 5th February, 1957.

AYLESBURY. ROYAL BUCKINGHAMSHIRE HOS-PITAL. SENIOR HOUSE OFFICER in Accident and Orthopædic Surgery and Children's Surgery. Recognised for F.R.C.S.

Apply, with 2 recent testimonials, to Secretary-Superintendent.

AYLESBURY. ROYAL BUCKINGHAMSHIRE HOS-PITAL. HOUSE OFFICER in Accident and Orthopædic Surgery and Children's Surgery. Recognised for F.R.C.S. Pre-registration post but registered practitioners invited to apply.

Apply, with 2 recent testimonials, to Secretary-Superintendent.

AYLESBURY, BUCKINGHAMSHIRE. STOKE MANDE-VILLE HOSPITAL. (609 Beds.) HOUSE PHYSICIAN for the Pædiatric Department. The post qualifies for D.C.H. Duties will include care of children in Infectious Diseases Unit, Plastic Unit and Outpatients Department, Royal Buckinghamshire Hospital, Recognised pre-registration post, applications from registered practitioners will be considered. Post vacant 1st March, 1957. Interview 14th February, 1957.

Apply, with copies of 2 testimonials, to the Administrative Officer.

BARNSLEY. BECKETT HOSPITAL. (172 Beds.) RESIDENT HOUSE SURGEON (Male or Female) required immediately. Post is approved for pre-registration purposes.

Applications should be forwarded to Secretary, Barnsley Hospital Management Committee, 33, Gawber-road, Barnsley.

BARNSTAPLE. NORTH DEVON INFIRMARY. (105 Beds.) HOUSE SURGEON required. Recognised pre-registration appointment ; the post can be taken up immediately.

Applications to Group Secretary, North Devon Hospital Management Committee, 19, Alexandra-road, Barnstaple.

BEDFORD (near). BROMHAM HOSPITAL. (434 Beds for Mental Defectives and 60 at Annexe near Sandy.) JUNIOR HOSPITAL MEDICAL OFFICER (psychiatry) required. Post may be non-resident and for 4 years in the first instance. Hospital may be visited by direct appointment with the Psychiatrist-Superintendent (Phone : Oakley 295).

Application forms obtainable from, and returnable to, Secretary, Bedford Group Hospital Management Committee, 3, Kimbolton-road, Bedford, by 23rd February, 1957.

BEDFORD GENERAL HOSPITAL. (439 Beds.) House SURGEON required. Pre- or post-registration. Recognised for F.R.C.S. Post offers exceptional opportunities for general experience in busy acute Surgical Units.

Inquiries and applications, with copies of 2 recent testimonials, to Group Secretary, 3, Kimbolton-road, Bedford.

BEVERLEY, YORKSHIRE. WESTWOOD HOSPITAL. (229 acute beds.) HOUSE SURGEON (first, second, or third post), vacant early February. General surgical duties, some orthopædics. Offering good opportunity for general experience in busy acute general hospital. Recognised for F.R.C.S. Approved pre-registration post. Fully qualified practitioners may apply. Married quarters may be available.

Applications to Group Secretary.

BEVERLEY, YORKSHIRE. WESTWOOD HOSPITAL. (229 acute beds.) HOUSE OFFICER in Obstetrics and Gynæcology. Pre-registration post. House Officer or Senior House Officer grading according to experience. Vacant shortly. Hospital has Maternity Unit of 22 Beds and Gynæcological Annexe of 18 Beds. Fully qualified practitioners may apply. Married quarters may be available.

Detailed applications to Group Secretary.

BEVERLEY, YORKSHIRE. WESTWOOD HOSPITAL. (229 acute beds.) HOUSE PHYSICIAN. House Officer or Senior House Officer grading according to experience. Pre-registration post, but fully qualified practitioners may apply. Married quarters may be available.

Apply Group Secretary.

BEVERLEY, YORKSHIRE. WESTWOOD HOSPITAL. (229 acute beds.) ORTHOPÆDIC HOUSE SURGEON (first, second, or third post), vacant end February. Offers good opportunity for general experience in busy acute general hospital. Approved pre-registration post. Fully qualified practitioners may apply. Recognised for F.R.C.S. Married quarters may be available.

Apply Group Secretary.

BIRMINGHAM (near). SOLIHULL HOSPITAL, Lode-lane, SOLIHULL. OBSTETRIC HOUSE SURGEON (pre-registration). Post vacant mid-February.

Applications, stating age, qualifications and names for reference, to Medical Superintendent.

BIRMINGHAM. THE UNITED BIRMINGHAM HOS-PITALS. THE CHILDREN'S HOSPITAL, Ladywood-road, BIRMINGHAM, 16. HOUSE OFFICER (medical) required for the Professorial Unit for 6 months from 7th April, 1957.

Forms of application may be obtained from the House Governor and should be returned not later than 16th February, 1957. G. A. PHALP, Secretary to the Board of Governors.

BIRMINGHAM. THE UNITED BIRMINGHAM HOSPITALS. Applications are invited for the post of RESIDENT ANÆSTHETIST (Senior House Officer grade). The post is tenable for 1 year. The appointment is recognised for the purpose of taking the F.F.A.R.C.S. examinations.

Application forms from the Secretary, United Birmingham Hospitals, Queen Elizabeth Hospital, Edgbaston, Birmingham, 15, and should be returned to him as soon as possible.

BIRMINGHAM. THE UNITED BIRMINGHAM HOSPITALS. Applications are invited for the post of RESIDENT REGISTRAR in Anæsthetics. The appointment is tenable for 1 year in the first instance. Preference will be given to candidates who have passed Part I, D.A., or Primary F.F.A.R.C.S.

Application forms may be obtained from the Secretary, United Birmingham Hospitals, Queen Elizabeth Hospital, Birmingham, 15, and should be returned to him as soon as possible.

BIRMINGHAM. THE SKIN HOSPITAL, INPATIENTS DEPARTMENT, George-road, BIRMINGHAM, 15. SENIOR HOUSE OFFICER or HOUSE OFFICER according to experience. Modern well-equipped Inpatients Department, providing facilities for study of skin diseases. Required to assist Consultant at outpatients clinics.

Applications, with copies of 2 recent testimonials, to Group Secretary, Dudley Road Hospital, Birmingham, 18.

BIRMINGHAM ACCIDENT HOSPITAL, Bath-row, BIRMINGHAM, 15. (215 Beds and 8 House Surgeons.) HOUSE SURGEONS (resident), vacant now and February. Recognised for the purpose of Casualty by R.C.S.(Eng.). Teaching programme by Consultant staff. Appointment for 6 months, some of which may be spent at applicant's request in 42-Bedded Medical Research Council's Burns Unit.

Apply, naming 2 referees, to Administrator within 7 days of this advertisement.

BIRMINGHAM AND MIDLAND EAR AND THROAT HOSPITAL, Edmund-street, BIRMINGHAM, 3. HOUSE OFFICER (recognised for pre-registration) required.

Apply to Group Secretary, Dudley Road Hospital, Birmingham, 18.

BIRMINGHAM REGIONAL HOSPITAL BOARD.

(1) **Stafford Group, 13, Foregate-street, Stafford**

REGISTRAR (orthopædics). Duties include attendance at Fracture Clinics at Staffordshire General Infirmary. Experience specialty desirable. Flat available.

(2) **West Bromwich Group, Edward-street, West Bromwich**

REGISTRAR (general medicine), resident. Married quarters available. Higher qualifications an advantage.

Application forms from Group Secretaries, to be returned by 4th February, 1957.

BISHOP AUCKLAND. THE GENERAL HOSPITAL. HOUSE OFFICER (obstetrics and gynæcology). Applications invited from registered or pre-registration practitioners. Vacant 1st March, 1957. Recognised for D.Obst.R.C.O.G. Departmental beds 69.

Apply, naming 2 referees, to Group Secretary, South West Durham Hospital Management Committee, at above address, as soon as possible.

BISHOP AUCKLAND, co. DURHAM. THE GENERAL HOSPITAL. (350 Beds.) SOUTH WEST DURHAM HOSPITAL MANAGEMENT COMMITTEE. HOUSE SURGEON required. Recognised pre-registration post.

Apply, naming 2 referees, to K. G. T. LUXFORD, Group Secretary, at the above address.

BLACKBURN AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. REGISTRAR (medicine) required end of February, 1957. Resident post. Duties at Royal Infirmary, Blackburn (262 acute beds) as arranged by Consultant Physician.

Application forms from Group Secretary, Hospital Management Committee Office, Royal Infirmary, Blackburn, Lancs.

BLACKBURN. ROYAL INFIRMARY. (262 general beds.) BLACKBURN AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. JUNIOR HOSPITAL MEDICAL OFFICER or SENIOR HOUSE OFFICER (casualty and orthopædics) required 28th February, 1957. Post recognised for F.R.C.S. Junior Hospital Medical Officer post can be for any period up to 4 years, and a starting salary above the minimum of the scale may be approved on account of special experience or qualifications.

Apply to Secretary, Hospital Management Committee Office, Royal Infirmary, Blackburn, Lancs.

BOLTON DISTRICT GENERAL HOSPITAL. (604 Beds.)

RESIDENT SENIOR HOUSE OFFICER in Medicine, vacant 14th February and tenable for 12 months.

RESIDENT HOUSE SURGEON for general surgical duties, vacant 1st March, tenable for 6 months, and recognised under the Pre-registration Service Scheme. Also recognised for F.R.C.S.

Applications, stating age, nationality, qualifications, experience and the names of 2 referees, to Group Secretary, Bolton and District Hospital Management Committee, The Royal Infirmary, Bolton.

BRADFORD, 1. ROYAL EYE AND EAR HOSPITAL. JUNIOR HOUSE SURGEON (ophthalmology). Recognised for D.O.M.S. and F.R.C.S.

Applications, stating age, nationality, qualifications, and experience, with copy testimonials, to Secretary, Bradford Royal Infirmary.

BRADFORD, YORKS. ROYAL EYE AND EAR HOSPITAL. (105 Beds.) SENIOR HOUSE OFFICER required for E.N.T. Department of 56 Beds. Recognised for D.L.O. and F.R.C.S. Post vacant 1st February, 1957. Salary £745 p.a., less £150 p.a. residential emoluments.

Applications, stating age, nationality, qualifications and experience with copy testimonials, to Secretary, Royal Infirmary, Bradford.

BOGNOR WAR MEMORIAL HOSPITAL. Resident SENIOR HOUSE OFFICER required to work under visiting Consultant Surgeon and Physician; also casualty work. Salary £745 p.a., less £150 p.a. for residence. 32 Beds. Modern fully equipped theatre. Good liaison with Chichester main hospitals and with local general practitioners. Also gives opportunity for postgraduate reading.

Apply, giving 3 referees' names, to Group Secretary, Chichester Group Hospital Management Committee, 174, Broyle-road, Chichester.

BOSTON. GENERAL HOSPITAL. (80 Beds.) Sheffield REGIONAL HOSPITAL BOARD. Whole-time RESIDENT REGISTRAR (general surgery and E.N.T.) required with relief duties in the Casualty Department. Appointment for 1 year in first instance.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 4th February, 1957, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

BOURNEMOUTH. ROYAL VICTORIA HOSPITAL, Shelley-road. BOURNEMOUTH AND EAST DORSET HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of GENERAL HOUSE SURGEON, which is now vacant. Favourable consideration will be given to suitable applicants for subsequent House Physician appointments. The appointment is recognised for the F.R.C.S. examination and for pre-registration purposes.

Applications to the Hospital Secretary.

BRIGHTON. ROYAL SUSSEX COUNTY HOSPITAL. (312 Beds.) HOUSE SURGEON (including gynæcology) required beginning of February. Pre-registration and recognised for F.R.C.S.

Applications, stating usual particulars, and naming 2 referees, to the Administrative Officer, Royal Sussex County Hospital, Brighton, 7.

BRIGHTON. ROYAL SUSSEX COUNTY HOSPITAL. SENIOR CASUALTY OFFICER (Junior Hospital Medical Officer), non-resident, required 28th January, 1957, at the above Hospital. Recognised for F.R.C.S.

Applications as locum or permanent post, stating usual particulars and the names of 2 referees, to the Administrative Officer.

BRIGHTON. NEW SUSSEX HOSPITAL FOR WOMEN, Windlesham-road. Locum HOUSE SURGEON (Female), Senior House Officer grading, required for the period 10th–22nd March, 1957, inclusive. Salary at the rate of £14 10s. per week less residential emoluments.

Applications, with full particulars, to be sent to the Administrative Officer by 6th February, 1957.

BRISTOL. SOUTHMEAD GENERAL HOSPITAL GROUP MANAGEMENT COMMITTEE. Required at Southmead Hospital (570 Beds, including 133 maternity) RESIDENT SENIOR HOUSE OFFICER (urological surgery) for 12 months commencing 1st February, 1957. Post recognised for F.R.C.S. examination.

Applications to be made on forms to be obtained from the undersigned. C. C. HANCOCK, Group Secretary.

Southmead Hospital, Bristol.

BRISTOL. COSSHAM/FRENCHAY HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER in Pathology required 1st April, 1957, at Frenchay Hospital (542 Beds —General Medicine, General Surgery, and Thoracic, Neurosurgical, and Plastic Units for the South West). Post may be resident or non-resident but residence essential when on call. It provides training in all branches of clinical pathology and Laboratory is recognised for Diploma in Pathology. Some duties in connection with the Regional Blood Transfusion Service.

Detailed applications, quoting names of 2 referees, should reach the Group Secretary, Frenchay Hospital, Bristol, by 9th February, 1957.

BRISTOL. COSSHAM/FRENCHAY HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of SENIOR HOUSE OFFICER ANÆSTHETIST at Frenchay Hospital (542 staffed beds). The position offers experience in thoracic, plastic, neuro and general surgery. Vacant 1st March, 1957. The post is normally resident but applications for a non-resident post will be considered.

Applications, with particulars of age, qualifications and previous posts and the names of 2 referees, should be sent to the Group Secretary, Frenchay Hospital, by 2nd February, 1957.

BROMSGROVE GENERAL HOSPITAL, Worcestershire. (423 Beds.) Applications are invited for the pre-registration post of HOUSE SURGEON at the above Hospital. Post vacant early February.

Applications, with the names of 3 referees, to the Hospital Secretary.

BROXBURN, WEST LOTHIAN. BANGOUR GENERAL HOSPITAL (near EDINBURGH). Applications are invited for the appointment as REGISTRAR in the Maxillo-Facial and Plastic Surgery Unit (associated with The Royal Infirmary and The Royal Hospital for Sick Children, Edinburgh). Salary and conditions of service in accordance with regulations.

Applications, with full particulars of qualifications and experience, together with names of 3 referees, should reach the Group Secretary and Treasurer, Board of Management, Bangour Hospital, Broxburn, West Lothian, within 14 days.

BURTON UPON TRENT. THE GENERAL HOSPITAL. Pre-registration HOUSE OFFICER (general surgery) required at the above Hospital which is recognised for the F.R.C.S.

Applications to Group Secretary as soon as possible.

CAMBRIDGE. ADDENBROOKE'S HOSPITAL. House SURGEON for 6 months from 15th March, 1957. Recognised Pre-registration Service.

Apply, stating age, nationality, qualifications and experience with dates, and copies of 3 testimonials, to Secretary by 9th February. Interviews mid-February.

CANTERBURY. KENT AND CANTERBURY HOSPITAL. (277 Beds.) The post of SENIOR HOUSE PHYSICIAN becomes vacant as from the middle of February, 1957. Salary £745 p.a., with National Health Service conditions.

Applications, together with copies of 2 recent testimonials, to be addressed to the Hospital Secretary at the above Hospital.

CANTERBURY. KENT AND CANTERBURY HOSPITAL. (277 Beds.) Applications are invited for the post of SENIOR HOUSE OFFICER (casualty) which becomes vacant at the end of March, 1957. Salary £745 p.a. Recognised for the F.R.C.S.

Applications to be sent to the Hospital Secretary at the above Hospital, together with copies of 3 recent testimonials.

CANTERBURY. KENT AND CANTERBURY HOSPITAL. (277 Beds.) E.N.T. AND EYE DEPARTMENTS. SENIOR HOUSE OFFICER. Salary £745 p.a. Post vacant at the end of March, 1957. Approved for F.R.C.S. and special diplomas.

Applications, together with copies of 2 recent testimonials, to be addressed to the Hospital Secretary at the above Hospital.

CANTERBURY. KENT AND CANTERBURY HOSPITAL. (277 Beds.) The post of PÆDIATRIC HOUSE PHYSICIAN, recognised for D.C.H., includes work in the Ward and Outpatient Department and also provides experience in the care of the newborn. Opportunities exist for the study of preventive medicine among children and child guidance work. Post vacant early in March, 1957. National Health Service salary and conditions.

Applications, together with 2 testimonials, to be addressed to the Hospital Secretary at the above Hospital.

CANTERBURY. KENT AND CANTERBURY HOSPITAL. (277 Beds.) The post of GENERAL SURGICAL AND UROLOGICAL HOUSE SURGEON (pre-registration or third post), which is recognised for the F.R.C.S., becomes vacant at the end of February, 1957. National Health Service salary and conditions.

Applications, together with copies of 2 recent testimonials, to be addressed to the Hospital Secretary at the above Hospital.

CARDIFF (near). CAERPHILLY AND DISTRICT MINERS' HOSPITAL. (226 acute general beds.) Applications are invited for posts of HOUSE OFFICER (obstetrics and gynæcology) and HOUSE SURGEONS (2 appointments), vacant on 1st February. Preference given to pre-registration candidates. The Hospital is recognised by the Royal College of Surgeons and an application for recognition has also been made to the Royal College of Obstetricians and Gynæcologists. 6 miles from the teaching Hospital at Cardiff.

Apply to Group Secretary, address as above.

CARDIFF. GLAN ELY HOSPITAL, Fairwater, Cardiff. SENIOR HOUSE OFFICER required at above Hospital.

Form of application from Group Secretary, Cardiff Hospital Management Committee, 44, Cathedral-road, Cardiff.

CARLISLE. GARLANDS HOSPITAL. (1060 Beds.) GARLANDS HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners for the post of SENIOR HOUSE OFFICER at the above Mental Hospital. Salary £745 p.a. Flat is available for which a deduction will be made. Appointment is subject to the National Health Service superannuation regulations and to the conditions and terms of service laid down by the Minister of Health.

Applications, stating age, qualifications and experience and the names of 2 referees, should be sent to the Medical Superintendent as soon as possible.

CARSHALTON, SURREY. ST. HELIER HOSPITAL. HOUSE SURGEON (approved for Pre-registration Service).

Applications, stating age, qualifications and experience, with copies of recent testimonials and the names of 2 referees, should be sent to the Secretary at above address.

CHELMSFORD AND ESSEX HOSPITAL. Applications are invited for the resident post of CASUALTY OFFICER (Senior House Officer). It is recognised for the F.R.C.S. and offers excellent experience in the treatment of fractures and diagnosis of acute medical and surgical emergencies. Opportunity is given for Casualty Officer to follow up his cases in the wards and to obtain operating experience in major theatre under the guidance of the Consultants or the Resident Surgical Officer. Off duty time is generous and the post is one likely to suit both an officer seeking a higher qualification in surgery or one intending General Practice. The vacancy will occur on 2nd March.

Apply Secretary, Chelmsford Hospital Management Committee, Chelmsford and Essex Hospital, Chelmsford.

CHICHESTER. ROYAL WEST SUSSEX HOSPITAL. SENIOR HOUSE SURGEON (Deputy Resident Surgical Officer) required at Royal West Sussex Hospital, Chichester (202 acute beds). Post recognised for F.R.C.S. Resident staff of 6—Resident Surgical Officer, 3 House Surgeons, Resident Medical Officer, and House Physician. Salary £745 p.a., less residential charge. Vacant 13th February, 1957.

Applications, stating age, experience, qualifications, with references or names of referees, to Senior Administrative Officer.

CHICHESTER. ST. RICHARD'S HOSPITAL. (400 Beds.) CHICHESTER GROUP HOSPITAL MANAGEMENT COMMITTEE. Required, 2 HOUSE SURGEONS for general surgery (pre-registration) for 6 months only in the first instance. Posts vacant now. Posts recognised for F.R.C.S.

Applications, stating age, qualifications and experience, giving names of 2 persons from whom reference may be obtained, should be sent to the Surgeon-Superintendent.

CHERTSEY, SURREY. ST. PETER'S HOSPITAL (late Botley's Park War Hospital). (430 Beds.) RESIDENT HOUSE SURGEON (Senior House Officer or Intern) required for the Gynæcological (30 Beds) and E.N.T. (16 Beds) Departments. Salary in accordance with terms and conditions of National Health Service.

Applications, together with names and addresses of referees, to be sent to the Physician-Superintendent, St. Peter's Hospital, as soon as possible.

CHERTSEY, SURREY. ST. PETER'S HOSPITAL (late Botley's Park War Hospital). (430 Beds.) ORTHOPÆDIC HOUSE SURGEON from 12th February, 1957. Senior House Officer or House Officer (Intern) grade. 100 orthopædic beds. Post recognised for F.R.C.S. and Pre-registration Service. Preference given to provisionally registered candidates. Salary in accordance with terms and conditions of National Health Service.

Applications, together with names and addresses of referees, to be sent to the Physician-Superintendent, St. Peter's Hospital, Chertsey, as soon as possible.

CHERTSEY, SURREY. ST. PETER'S HOSPITAL (late Botley's Park War Hospital). (430 Beds.) SENIOR HOUSE OFFICER ANÆSTHETIST required as Locum from 28th February, 1957, to 13th March, 1957, and permanent post to commence 1st April, 1957. Appointment recognised for D.A. and F.F.A.R.C.S. Salary in accordance with terms and conditions of National Health Service.

Applications, together with names and addresses of referees, to be sent to the Physician-Superintendent, St. Peter's Hospital, as soon as possible.

CHESTER-LE-STREET. GENERAL HOSPITAL. (204 Beds.) SENIOR HOUSE OFFICER (general surgery). Post vacant 1st February, 1957.

Apply, with names and addresses of 2 referees, to Group Secretary, Dryburn Hospital, Durham.

COLCHESTER HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for :—

Essex County Hospital, Colchester (185 Beds)

HOUSE OFFICER (surgical). First, second, third or pre-registration post, tenable for 6 months. Recognised for F.R.C.S.

Black Notley Hospital, Braintree (516 Beds)

Posts of HOUSE SURGEON and HOUSE PHYSICIAN. The successful applicant will serve 6 months as House Surgeon followed by 6 months as House Physician. First, second, third or pre-registration posts. Surgical post includes duties in general surgical and gynæcological wards. Recognised for F.R.C.S. Medical post includes duties in medical and pædiatric wards.

Applications, with copies of 3 testimonials, to Group Secretary, 14, Pope's-lane, Colchester.

CREWE AND DISTRICT MEMORIAL HOSPITAL. (108 Beds—Acute.) SURGICAL REGISTRAR required at the above Hospital (approved for F.R.C.S.), vacant 1st April, 1957. Modern theatres. Separate accommodation available.

Applications, stating age, qualifications and experience, together with names of 3 referees, to the Group Secretary, South Cheshire Hospital Management Committee, Barony Hospital, Nantwich, Cheshire.

DORKING GENERAL HOSPITAL, Horsham-road, DORKING, SURREY. SENIOR HOUSE OFFICER (obstetrics and gynæcology), whole-time appointment, vacant 15th February, 1957. Post recognised for D.Obst.R.C.O.G.

Apply to the Medical Superintendent.

DOUGLAS. NOBLE'S ISLE OF MAN HOSPITAL. (160 Beds.) Applications are invited for post of HOUSE PHYSICIAN at this busy Hospital, which has been approved for Pre-registration Service. The post, which becomes vacant mid-February, 1957, offers varied experience. 4 residents on the staff. Salary scale £425–£475 according to experience.

Applications, enclosing copies of 2 recent testimonials, to the Secretary, Noble's Hospital, Douglas, Isle of Man.

DOUGLAS. NOBLE'S ISLE OF MAN HOSPITAL. (160 Beds.) Applications are invited for the post of CASUALTY OFFICER/ANÆSTHETIST (House Officer grade post), vacant end of January, 1957. 4 residents on staff. Salary £425–£475–£525 according to experience.

Applications, enclosing copies of 2 recent testimonials, to the Secretary, Noble's Hospital, Douglas, Isle of Man.

DOUGLAS. NOBLE'S ISLE OF MAN HOSPITAL. (160 Beds.) Applications are invited for the post of HOUSE SURGEON. The post is recognised for pre-registration purposes, and becomes vacant in mid-March, 1957. 4 residents on staff. Salary £425–£475 according to experience.

Applications, enclosing copies of 2 recent testimonials, to the Secretary, Noble's Hospital, Douglas, Isle of Man.

DRIFFIELD, YORKSHIRE. NORTHFIELD SANATORIUM. (78 Beds.) SENIOR HOUSE PHYSICIAN, vacant now. Offers experience all branches of tuberculosis within the Group, including surgery, M.M.R., and clinics. Time for study. Ex-patients welcome. £150 for full residence.

Applications to Group Secretary, Westwood Hospital, Beverley, Yorkshire.

DUDLEY, STOURBRIDGE AND DISTRICT HOSPITAL GROUP, BIRMINGHAM REGION.

The Guest Hospital, Dudley (154 Beds)

SENIOR HOUSE OFFICER (casualty). Post now vacant.

HOUSE OFFICER (surgical), pre-registration. Post vacant January, 1957.

Apply, Group Secretary, Guest Hospital, Dudley.

ENFIELD, MIDDLESEX. CHASE FARM HOSPITAL. RESIDENT SENIOR HOUSE OFFICER required in the Department of Anæsthesia, vacant 10th March, 1957. 12 months appointment. The post is recognised for the D.A. and F.F.A.R.C.S. and affords a wide range of practical experience and tuition under Consultant supervision.

Applications, giving names and addresses of 2 referees, to the Group Secretary, Enfield Group Hospital Management Committee, at Chase Farm Hospital.

ENFIELD, MIDDLESEX. CHASE FARM HOSPITAL. RESIDENT HOUSE SURGEON (pre-registration post), vacant 22nd March, 1957. Duties with General Surgical Unit, doing some gen.-to-urinary work. Post recognised by the Royal College of Surgeons. 6 months appointment.

Applications, with names and addresses of 2 referees, to the Group Secretary, Enfield Group Hospital Management Committee, at Chase Farm Hospital.

EAST ANGLIAN REGIONAL HOSPITAL BOARD. SENIOR SURGICAL REGISTRAR, United Norwich Hospitals. Main hospital Norfolk and Norwich—441 Beds and recognised for F.R.C.S. Trainee post. Higher qualification desirable. Candidates invited to visit hospitals by direct arrangement with Hospital Management Committee Secretary, Norfolk and Norwich Hospital.

REGISTRAR in Psychiatry, Hellesdon Hospital, Norwich. Associated with this modern mental hospital (960 Beds) are a separate early treatment hospital with an Electro-encephalographic Department, outpatient clinics for both adults and children, and a special unit for the elderly mentally infirm. Post recognised for D.P.M. House available. Appointment for 1 year, renewable for second year. Candidates are invited to visit Hospital by direct arrangement with the Medical Superintendent.

Applications, stating age, experience, and the names of 3 referees, to Board's Senior Administrative Medical Officer, 117, Chesterton-road, Cambridge, by 4th February, 1957.

GLASGOW. ROBROYSTON HOSPITAL. There are immediate vacancies for a JUNIOR HOSPITAL MEDICAL OFFICER and a Locum JUNIOR HOSPITAL MEDICAL OFFICER, preferably non-resident. The work carried out consists mainly of tuberculous pulmonary disease, though substantial units exist for skeletal and for urological tuberculosis. A small unit for acute respiratory disease exists, and there are also units for non-tuberculous chest diseases and for geriatrics.

Applications in writing should be forwarded immediately to Physician-Superintendent, Robroyston Hospital, Glasgow, E.3.

GLASGOW NORTHERN HOSPITALS BOARD OF MANAGEMENT. Applications are invited for the post of SENIOR HOUSE OFFICER in Pathology and Hæmatology at Stobhill General Hospital, Glasgow. The appointment will be for 1 year in the first instance.

Applications, stating age, qualifications, experience and present appointment and naming 2 referees, to be lodged immediately with the Secretary, 13, Woodside-place, Glasgow, C.3.

GLASGOW. ROYAL HOSPITAL FOR SICK CHILDREN, YORKHILL, GLASGOW. JUNIOR HOSPITAL MEDICAL OFFICER (resident) required for Medical Pædiatric Unit. National Health Service salary and conditions of service.

Applications, stating age and giving full details of qualifications and experience, with the names of 3 referees, to be lodged with the Secretary of the Board of Management for Glasgow and District Children's Hospitals, 86, St. Vincent-street, Glasgow, C.2, by 5th February, 1957.

GLASGOW, S.W.1. SOUTHERN GENERAL HOSPITAL. SENIOR HOUSE OFFICER in Psychiatry.

Write immediately to Secretary, Board of Management for Glasgow South-Western Hospitals, 1301, Govan-road, Glasgow, S.W.1, naming 2 referees.

GRIMSBY GROUP OF HOSPITALS. Sheffield Regional HOSPITAL BOARD. Whole-time RESIDENT or NON-RESIDENT REGISTRAR (obstetrics and gynæcology) required. Appointment for 1 year in first instance.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 4th February, 1957, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

GUILDFORD GROUP HOSPITAL MANAGEMENT COMMITTEE. SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for the appointment of REGISTRAR (resident) in Pathology in the Group Pathological Laboratory, Guildford Group Hospital Management Committee. Candidates may visit the Laboratory by arrangement.

Application forms from Group Secretary, Guildford Group Hospital Management Committee, St. Luke's Hospital, Guildford, to whom they should be returned by 9th February, 1957.

GUILDFORD. ROYAL SURREY COUNTY HOSPITAL. (233 Beds.) RESIDENT HOUSE SURGEON required for general surgery. Post is vacant on 25th February and tenable for 6 months. It is approved for pre-registration practitioners and recognised for the F.R.C.S. examination.

Applications, with copies of 3 testimonials, should be sent to the Hospital Secretary as soon as possible.

GUILDFORD. ST. LUKE'S HOSPITAL. Applications are invited for the post of CLINICAL ASSISTANT to the Skin Department for 2 sessions (Wednesdays) per week. Previous experience in dermatology is essential. The appointment is for 1 year in the first instance.

Applications, with full details, to Physician-Superintendent.

HASTINGS. ROYAL EAST SUSSEX HOSPITAL. (150 Beds.) SENIOR HOUSE OFFICER (casualty and orthopædics) required. Post vacant 6th February, 1957.

Apply, with copies of 2 testimonials, to the Hospital Administrator as soon as possible.

HASTINGS. ST. HELEN'S HOSPITAL. (493 Beds.) HOUSE SURGEON (pre-registration post), recognised for F.R.C.S., vacant now.

Apply to Hospital Administrator as soon as possible.

HERTFORD COUNTY HOSPITAL. (171 Beds. Hospital situated 21 miles from London.) RESIDENT CASUALTY OFFICER (Senior House Officer grade) with attachment to Pædiatrician and Ophthalmic Consultant. Salary £745 p.a., less £150 p.a. residential emoluments. Recognised under F.R.C.S. regulations. Appointment to commence immediately.

Apply, with full details and references, to Group Secretary, Hertford Hospital Management Committee, County Hospital, Hertford, Herts.

HUNTINGDON COUNTY HOSPITAL. Applications are invited for the post of HOUSE OFFICER (surgical), vacant mid-February. Post recognised for pre-registration purposes.

Apply, with full particulars and names of 2 referees, to Secretary, County Hospital, Huntingdon.

HORNCHURCH. ST. GEORGE'S HOSPITAL. Junior HOSPITAL MEDICAL OFFICER (resident) required immediately at this Hospital which accommodates 404 chronic sick patients. The post offers excellent geriatric experience.

Applications should be forwarded to the Secretary, Romford Group Hospital Management Committee, Oldchurch Hospital, Romford, as soon as possible.

HULL. KINGSTON GENERAL HOSPITAL. (419 Beds.) HULL A GROUP HOSPITAL MANAGEMENT COMMITTEE. HOUSE SURGEON (pre-registration post), resident, and tenable for 6 months. This post includes gynæcology, E.N.T., and general surgery. Vacant early February.

Applications, with 2 recent testimonials, to the Hospital Secretary.

HULL. VICTORIA HOSPITAL FOR SICK CHILDREN, Park-street. HULL A GROUP HOSPITAL MANAGEMENT COMMITTEE. 2 HOUSE SURGEONS required at the above Hospital; 1 post vacant 17th February, 1 post vacant 28th February. Registration or pre-registration posts. 6-monthly term in each case; both posts recognised for the D.C.H. qualification. Salary according to national scale.

Replies, with testimonials, should be sent to the Hospital Secretary.

ISLEWORTH. WEST MIDDLESEX HOSPITAL. North WEST METROPOLITAN REGIONAL HOSPITAL BOARD. SENIOR REGISTRAR (E.N.T. Department), whole-time, non-resident. Hospital may be visited by direct appointment.

Application forms obtainable from, and returnable to, Group Secretary, South West Middlesex Hospital Management Committee, West Middlesex Hospital, Isleworth, Middlesex, by 5th February, 1957.

KIDDERMINSTER AND DISTRICT GENERAL HOS-PITAL. (112 Beds.) Applications are invited for the pre-registration post of HOUSE SURGEON at the above Hospital. Post vacant shortly.

Applications, with the names of 3 referees, to the Hospital Secretary.

KIRKCALDY, FIFESHIRE. VICTORIA HOSPITAL. HOUSE OFFICER required for part-time duties in the acute medical wards and part-time in the Geriatric Unit. Status according to experience. The post qualifies for pre-registration.

Apply, with copies of testimonials or 2 references, to the Medical Superintendent, East Fife Hospitals Board of Management, 243A, High-street, Kirkcaldy.

LEAMINGTON SPA. WARNEFORD GENERAL HOS-PITAL. (197 Beds.) RESIDENT HOUSE SURGEON (general surgery). Post vacant. Recognised for pre-registration and F.R.C.S. Post provides excellent experience. Good accommodation available.

Applications, with 2 recent testimonials, to Hospital Secretary.

LEEDS, 7. CHAPEL ALLERTON HOSPITAL. (281 Beds.) SENIOR HOUSE OFFICER (surgical) required. National Health Service terms and conditions.

Apply Medical Superintendent.

LEEDS REGIONAL HOSPITAL BOARD. Registrar vacancies.

Anæsthetics

(i) St. Luke's Hospital, Bradford (300 surgical beds), and other hospitals in the Bradford A group. Resident. Recognised for the F.F.A.R.C.S.

(ii) Hull A, Hull B and East Riding Groups. Recognised for F.F.A.R.C.S.

General Surgery

Hull A Group. Mainly at Western and Kingston General Hospitals (150 general surgical beds). Resident or non-resident. Recognised for F.R.C.S. May include additional duties in the Casualty Department.

Obstetrics and Gynæcology

Hull A Group (84 obstetrical and 74 gynæcological beds). Recognised for M.R.C.O.G. Resident.

Orthopædic Surgery

St. James's Hospital, Leeds (64 orthopædic beds), and the Public Dispensary, Leeds. Non-resident.

Applications, stating age, qualifications and details of present and previous appointments with dates, together with the names and addresses of 3 referees, to the Secretary, the Joint Registrars Committee, Park-parade, Harrogate, by 1st February, 1957.

LEEDS. UNITED LEEDS HOSPITALS/LEEDS REGIONAL HOSPITAL BOARD. REGISTRAR in Thoracic Surgery. First year normally at the Regional Thoracic Centre, Pinderfields General Hospital, Wakefield (56 Beds), which is under the charge of the Consultants to the Teaching Hospital. Recognised for F.R.C.S. Second year, if possible at the General Infirmary at Leeds.

Applications, stating age, qualifications and details of appointments held showing dates, with names and addresses of 3 referees, to the Secretary, Joint Registrars Committee, Park-parade, Harrogate, by 1st February, 1957.

LEICESTER (near). MARKFIELD HOSPITAL. (215 Beds.) Applications are invited for the appointment of RESIDENT SENIOR HOUSE OFFICER (medical). Salary £745 p.a., less £150 residential emoluments. The appointment is tenable for 12 months and may be extended, and there will be time and opportunity for study. Experience will be gained in chest diseases with close association with the Major Chest Unit in the area.

Applications, giving age, qualifications, dates, &c.; together with copies of 2 recent testimonials, to be sent as soon as possible to the Physician-Superintendent at the above Hospital.

LINCOLN COUNTY HOSPITAL. (200 Beds.) Applications are invited for the pre-registration post of HOUSE SURGEON. The post is tenable for a period of 6 months from 1st February, 1957, and will be followed by a pre-registration post of House Physician.

Applications, giving full particulars, should be addressed to—
R. W. HOWICK, Group Secretary.

LANCASTER. ROYAL LANCASTER INFIRMARY. (240 Beds.) RESIDENT HOUSE OFFICER (medical), pre-registration post. Duties include care of acute cases under the supervision of 2 Consultant Physicians and attendance at Consultative Clinics. Post vacant 1st February next; tenable for 6 months.

Applications, with names of 2 referees, to Secretary (M), Royal Lancaster Infirmary, Lancaster.

LANCASTER. ROYAL LANCASTER INFIRMARY. (240 Beds.) RESIDENT HOUSE OFFICER (surgical), pre-registration post. Successful applicant will work with Consultant Surgical Unit and attend Consultative Clinics. Post vacant 1st February next; tenable for 6 months. Recognised for F.R.C.S.

Applications, with names of 2 referees, to the Secretary (S), Royal Lancaster Infirmary, Lancaster.

LIVERPOOL, 20. BOOTLE HOSPITAL. Applications are invited for a post as CASUALTY OFFICER (Junior Hospital Medical Officer grade) at this busy Hospital. The post will be vacant from 1st March, 1957.

Apply to Secretary, Walton Hospital, Liverpool, 9, giving details of experience, qualifications, age, date of registration, and names of 2 referees.

LLWYNPIA HOSPITAL, Llwynpia, Rhondda. (190 Beds, including acute medical and chronic sick beds.) HOUSE OFFICER (medical). Person appointed will also undertake duties at the Group Infectious Diseases Hospital when required.

Applications, stating age, qualifications and experience, together with copies of 2 recent testimonials, to be sent to the Group Secretary, Pontypridd and Rhondda Hospital Management Committee, Courthouse-street, Pontypridd.

MAIDENHEAD HOSPITAL, St. Luke's-road, Maidenhead. RESIDENT SURGICAL REGISTRAR required.

Application form from, and returnable to, Secretary, Windsor Group Hospital Management Committee, Alma-road, Windsor, by 3rd February.

MAIDSTONE. WEST KENT GENERAL HOSPITAL. (141 Beds.) MID-KENT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the pre-registration post of HOUSE SURGEON. 6 months appointment. Post vacant February, 1957. Salary at the rate of £425–£525 p.a. A deduction at the rate of £125 a year is made for board and lodging, and other services provided.

Applications should be forwarded, as soon as possible, to the Administrative Officer at the Hospital.

MAIDSTONE. WEST KENT GENERAL HOSPITAL. (141 Beds.) MID-KENT HOSPITAL MANAGEMENT COMMITTEE. CASUALTY OFFICER (Senior House Officer). Recognised for F.R.C.S. Salary £745 a year, less £150 a year for board and lodging. Post vacant February, 1957.

Applications to the Administrative Officer at the Hospital.

MANCHESTER. CRUMPSALL HOSPITAL. Applications are invited for the resident post of REGISTRAR in Obstetrics and Gynæcology at the above Hospital, vacant 1st March, 1957. Recognised for M.R.C.O.G. This post offers extensive clinical experience.

Applications, with names of 2 referees, by 4th February, 1957, to Group Secretary, North Manchester Hospital Management Committee, Crumpsall Hospital, Manchester, 8.

MANCHESTER REGIONAL HOSPITAL BOARD. REGISTRAR for the Geriatric Department of the Bolton and District Group of hospitals. Vacant mid-February.

Applications, stating age, nationality, qualifications, experience, and the names of 2 referees, should be sent immediately to Group Secretary, Bolton and District Hospital Management Committee, The Royal Infirmary, Bolton.

MANCHESTER REGIONAL HOSPITAL BOARD invite applications for the post of REGISTRAR in Orthopædic Surgery to the Blackpool and Fylde Group of hospitals, with main duties at Victoria Hospital, Blackpool. There are 63 orthopædic beds in the group and busy outpatient clinics. Ample scope for gaining experience in all aspects of the work of the department. Post recognised for F.R.C.S. examination and vacant from 1st April, 1957. A furnished flat is available in the married quarters situated in a detached property in a select residential area adjacent to the Hospital.

Applications, stating age, qualifications, experience, and the names and addresses of 3 referees, should be sent to the Group Secretary, Blackpool and Fylde Hospital Management Committee, Victoria Hospital, Blackpool.

MANCHESTER REGIONAL HOSPITAL BOARD. ROCHDALE INFIRMARY. (109 surgical beds.) RESIDENT SURGICAL OFFICER (Registrar grade) required for this busy surgical hospital which has a large Outpatients Department. Recognised for F.R.C.S.

Apply at once, with details of experience and qualifications, and names of 3 referees, to Group Secretary, Central Offices, Birch Hill Hospital, Rochdale.

MANCHESTER REGIONAL HOSPITAL BOARD.

(*a*) 2 posts of SENIOR REGISTRAR in Psychiatry as follows:—

(i) Salford Group of Hospitals (Salford Royal and Hope Hospitals) and Springfield (Mental) Hospital, Manchester.

(ii) Bury and Rossendale and Rochdale Groups of hospitals. The person appointed to the latter post may be required to transfer for a period of service to Prestwich Mental Hospital, near Manchester, or to another psychiatric team based on a general hospital centre elsewhere in the region where further experience and training can be obtained. 11th February, 1957.

(*b*) SENIOR REGISTRAR in Chest Diseases with main duties at the Manchester Chest Clinic and also in the Thoracic Surgery Units at Park and Baguley Hospitals, &c. 12th February, 1957.

Application forms, obtainable from the Senior Administrative Medical Officer of the Board, Cheetwood-road, Manchester, 8, should be returned by dates stated.

MANCHESTER. SOUTH MANCHESTER HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of SENIOR HOUSE OFFICER (anæsthetics) with duties in the South Manchester Group. This post is recognised by the Royal College of Surgeons for the F.F.A.R.C.S. and for the D.A.

Applications, stating age, present post, experience, and names of 2 referees, to be forwarded immediately to the Group Secretary, Withington Hospital, Manchester, 20.

MANCHESTER. WEST MANCHESTER HOSPITAL MANAGEMENT COMMITTEE. PARK HOSPITAL, DAVYHULME. (General Hospital—433 Beds.) SENIOR HOUSE OFFICER required for Group Laboratory. Post vacant early April, 1957, and tenable for 1 year. Duties which alternate with holder of second similar post include routine general pathology and emergency investigations. Laboratory recognised for D.Path. and D.C.P. examinations. Previous experience not essential.

Application forms from Group Secretary.

MANCHESTER, 20. WITHINGTON HOSPITAL, South MANCHESTER HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of RESIDENT CLINICAL PATHOLOGIST (Senior House Officer grade). Previous experience in pathology not essential, the post affording opportunities for gaining experience in all branches of clinical pathology.

Applications, stating age, qualifications, present post, experience and the names of 2 referees, to be forwarded to the Group Secretary, Withington Hospital, Manchester, 20.

MANCHESTER. UNITED MANCHESTER HOSPITALS. SAINT MARY'S HOSPITALS. Applications are invited for the post of RESIDENT CLINICAL PATHOLOGIST (Senior House Officer grade), vacant shortly. Candidates must have held house appointments but previous laboratory experience is not essential. The duties will consist of routine work in the Department of Clinical Pathology, mainly at Saint Mary's Hospitals, but the holder of the post will also spend some time in the Manchester Royal Infirmary.

Applications to be made on the forms obtainable from the undersigned and submitted by 2nd February, 1957.

A. R. WISE, General Superintendent.

Saint Mary's Hospitals, Whitworth Park, Manchester, 13.

NEWCASTLE GENERAL HOSPITAL. (638 Beds.) NEWCASTLE UPON TYNE HOSPITAL MANAGEMENT COMMITTEE. HOUSE OFFICER (resident) required for General Surgical Unit. Recognised for F.R.C.S. Diploma.

Applications, together with 1 copy of 2 recent testimonials, should be sent to the Secretary, Newcastle General Hospital, Newcastle upon Tyne, 4.

NEWCASTLE REGIONAL HOSPITAL BOARD.

REGISTRAR PSYCHIATRIST (whole-time), St. George's Hospital, Morpeth (1250 Beds). Accommodation available.

REGISTRAR PSYCHIATRIST (whole-time), resident, Winterton Hospital, Sedgefield (2040 Beds).

Arrangements can be made for the appointees to take the necessary courses of study for the University of Durham D.P.M.

Applications, with names and addresses of 3 referees, to Regional Psychiatrist, Benfield-road, Newcastle upon Tyne, 6, within 10 days.

NEWCASTLE REGIONAL HOSPITAL BOARD.

SENIOR REGISTRAR RADIOLOGIST (whole-time), East Cumberland Group of hospitals—Cumberland Infirmary (340 Beds); City General Hospital (190 Beds). Single accommodation available. Further particulars from Senior Radiologist, Cumberland Infirmary, Carlisle.

REGISTRAR PATHOLOGIST (whole-time), Tees-side Group of hospitals—Central Clinical Laboratory, General Hospital, Middlesbrough. Appointment offers excellent opportunities for training in all branches of clinical pathology. Single accommodation available.

REGISTRAR OBSTETRICIAN AND GYNÆCOLOGIST (whole-time), Gateshead Group of hospitals—Queen Elizabeth Hospital (176 Beds—42 obstetrics and gynæcology); Bensham Hospital (230 Beds—47 obstetrics and gynæcology); Dunston Hill Hospital (10 gynæcology beds). Single accommodation available.

Applications, with names and addresses of 3 referees, to Senior Administrative Medical Officer, Regional Hospital Board, Benfield-road, Newcastle upon Tyne, 6, within 10 days.

NEWCASTLE. THE UNITED NEWCASTLE UPON TYNE HOSPITALS. Applications are invited from registered medical practitioners for the appointment of HOUSE SURGEON to the E.N.T. Department at the Royal Victoria Infirmary. The appointment is for the period to 6th July, 1957, and will be subject to the terms and conditions of service of hospital medical staff in the National Health Service.

Applications, giving full details and the names and addresses of 2 referees, should be sent to the undersigned within 2 weeks of the appearance of this advertisement.

A. W. SANDERSON, House Governor and Secretary.

Royal Victoria Infirmary, Newcastle upon Tyne.

NEWCASTLE. THE UNITED NEWCASTLE UPON TYNE HOSPITALS. Applications are invited for the resident appointment of SENIOR HOUSE OFFICER to the Department of Obstetrics and Gynæcology. The successful candidate will have duties in the Royal Victoria Infirmary and the Princess Mary Maternity Hospital. The appointment is for 1 year and will be subject to the terms and conditions of service of hospital medical staff in the National Health Service. The salary will be at the rate of £745 p.a., subject to the appropriate deductions.

Applications, giving full details and the names and addresses of 3 referees, should be sent to the undersigned within 2 weeks of the appearance of this advertisement.

A. W. SANDERSON, House Governor and Secretary.

Royal Victoria Infirmary, Newcastle upon Tyne.

NOTTINGHAM. HIGHBURY HOSPITAL, Bulwell, NOTTINGHAM. Locum SENIOR HOUSE OFFICER (resident), obstetrics and gynæcology, required for 3rd–17th February, 1957. Maternity Unit of 41 obstetrical beds and 11 gynæcological beds.

Apply Secretary.

NOTTINGHAM. CITY HOSPITAL. (811 Beds.) Applications are invited for the post of HOUSE SURGEON, vacant 1st March, 1957. Recognised for pre-registration purposes.

Applications, stating age, nationality, qualifications and experience, together with copies of not more than 3 testimonials, to be sent to the Hospital Secretary, City Hospital, Hucknall-road, Nottingham.

NORTHWOOD, MIDDLESEX. MOUNT VERNON HOSPITAL. ANÆSTHETIC REGISTRAR required for the Centre for Plastic Surgery. Duties will consist of routine work in the Centre together with emergency work both in the Centre and in the general hospital. Candidates should be working for, or in possession of, the higher qualifications in anæsthesia.

Application forms obtainable from, and returnable to, the Group Secretary, Harefield and Northwood Group Hospital Management Committee, Mount Vernon Hospital, Northwood, Middlesex, by 16th February, 1957.

ORPINGTON HOSPITAL, Orpington, Kent. Resident SENIOR HOUSE PHYSICIAN required in March for 60-Bedded Tuberculosis Unit (30 male and 30 female). Good experience in diagnosis and treatment of acute and chronic pulmonary tuberculosis. Excellent opportunity for higher qualification study with access to clinical material in general medical and surgical wards. Ex-patient medical officer favourably considered.

Apply Physician-Superintendent.

OXFORD REGIONAL HOSPITAL BOARD. Locum REGISTRAR with experience in general surgery and medicine, for National Spinal Injuries Centre, Stoke Mandeville Hospital, Aylesbury.

Apply to the Director.

OXFORD REGIONAL HOSPITAL BOARD Registrar in Pathology to Stoke Mandeville Hospital. This is a central clinical laboratory serving Stoke Mandeville and the Aylesbury hospitals, and acting as parent to High Wycombe and Amersham laboratories. It is closely connected with research projects being undertaken at Stoke Mandeville Hospital. Appointment for 1 year in the first instance, eligible for extension for a second year. Applicants may visit Stoke Mandeville by arrangement with the Pathologist.

Application forms from the Secretary, Registrars Committee, 43, Banbury-road, Oxford, should be returned to him by 11th February, 1957.

AMENDED ADVERTISEMENT

OXFORD REGIONAL HOSPITAL BOARD. Registrar to the Casualty Department of High Wycombe Hospital (non-resident). The post, recognised for the F.R.C.S., forms part of the Regional Accident Service based on Oxford and provides opportunities for attending conference at the Nuffield Orthopædic Centre. Appointment for 1 year, eligible for extension to 2 years. Vacant 1st March.

Application forms, obtainable from the Secretary, 43, Banbury-road, Oxford, must be returned by 14th February, 1957.

OXFORD. UNITED OXFORD HOSPITALS. Applications invited for the post of HOUSE OFFICER in the Oxford Eye Hospital, with effect from 1st April, 1957.

Applications, stating age, qualifications, and experience, together with names of 2 referees, to the Administrator, Radcliffe Infirmary, Oxford, by 8th February.

PLYMOUTH. SOUTH DEVON AND EAST CORNWALL HOSPITAL.

SENIOR HOUSE OFFICER in Surgery, vacant 1st February, 1957. Recognised for the F.R.C.S. Greenbank Road Section.

Applications, stating age, nationality, qualifications, and experience, together with the names and addresses of 3 referees, to be sent to Deputy Group Secretary, Plymouth, South Devon and East Cornwall General Hospital Group, 7, Nelson-gardens, Stoke, Plymouth.

PORTSMOUTH GROUP HOSPITAL MANAGEMENT COMMITTEE.

Royal Portsmouth Hospital

HOUSE SURGEONS. 70 Beds. Pre-registration posts. Vacant 1st March.

Orthopædic Department

HOUSE OFFICER (pre-registration post), vacant 27th February.

Locum SENIOR HOUSE OFFICER for 3–4 months from 11th February.

Applications, stating age, experience and qualifications, together with the names of 2 referees, should be forwarded as soon as possible to E. H. HURST.

St. Mary's Hospital, Milton-road, Portsmouth.

PONTYPRIDD (near). EAST GLAMORGAN HOSPITAL, CHURCH VILLAGE. (316 Beds and large Outpatient Department. Committee's Base Hospital serving population of 174,000. Recognised for D.Obst.R.C.O.G., F.R.C.S., D.C.H., F.F.A.R.C.S., D.A.) PONTYPRIDD AND RHONDDA HOSPITAL MANAGEMENT COMMITTEE. HOUSE OFFICER (surgery), to commence 1st February, 1957 (to include duties at the Porth and District Hospital).

Applications, stating age, qualifications and experience, together with copies of 2 recent testimonials, to be sent to the Group Secretary, Courthouse-street, Pontypridd.

PURLEY HOSPITAL. (53 Beds.) Croydon Group Hospital MANAGEMENT COMMITTEE. CLINICAL ASSISTANT for 1 notional half-day weekly as Relief for Resident Medical Officer. Payment £175 p.a. per ½-day session.

Details of duties will be forwarded to applicants, who should apply in writing to—

GEORGE A. PAINES, Group Secretary,
Hospital Management Committee.

General Hospital, London-road, Croydon.

RAMSGATE. GENERAL HOSPITAL. (101 Beds.) HOUSE SURGEON. Approved pre-registration post. Salary at the rate of £425–£525 p.a., according to experience, less £125 for residential emoluments.

Applications, with copies of testimonials, to Hospital Secretary.

READING AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of RESIDENT SENIOR HOUSE OFFICER (Area Accident and Orthopædic Department), vacant immediately. Recognised for F.R.C.S. Duties including work in area Casualty Department at Battle Hospital, Reading (300 Beds). Person appointed will work with Registrar and House Officers.

Apply, stating nationality, present post and qualifications with dates, together with names of 2 referees, to Group Secretary, 3, Craven-road, Reading.

READING AREA DEPARTMENT OF MEDICINE. Applications are invited from registered and provisionally registered medical practitioners for 2 posts as RESIDENT HOUSE PHYSICIAN, vacant 1st March, 1957, for a period of 6 months. Successful candidates will be required to carry out duties at the following Reading Hospitals: Royal Berkshire (398 Beds), Battle (374 Beds), and Prospect Park (104 Beds).

Write before 19th February, stating age, qualifications with dates, nationality, present post, with copy of 2 recent testimonials, to Secretary, Royal Berkshire Hospital, Reading.

READING. BATTLE HOSPITAL. (391 Beds.) Applications are invited from registered medical practitioners for the post of RESIDENT JUNIOR HOUSE SURGEON (orthopædic) in the Area Accident and Orthopædic Department. Post vacant 14th February. F.R.C.S. recognised. Also casualty duties. Salary £425–£525 p.a., less £150 board-residence.

Apply, stating age, qualifications with dates, nationality, present post with 1 copy of recent testimonial, to Hospital Secretary.

READING. ROYAL BERKSHIRE HOSPITAL. (398 Beds.) Applications are invited from registered and provisionally registered medical practitioners for the resident post of HOUSE PHYSICIAN in the Pædiatric Department, vacant 1st March, 1957, and tenable for 6 months.

Write immediately, stating age, qualifications with dates, nationality, present post, with copy of 1 recent testimonial, to Secretary.

REDHILL COUNTY HOSPITAL, Earlswood Common, REDHILL, SURREY. REGISTRAR (obstetrics and gynæcology). Resident appointment, married quarters available, becomes vacant 1st May, 1957. Recognised for M.R.C.O.G. Unit of 52 obstetrical and 26 gynæcological beds.

Application forms from Group Secretary, Redhill Hospital Management Committee, "Earlswood Mount," Pendleton-road, Redhill, Surrey. Returnable within 14 days.

REDHILL COUNTY HOSPITAL, Earlswood Common, REDHILL, SURREY. RESIDENT HOUSE SURGEONS. 2 pre-registration appointments, vacant 1st March, recognised for F.R.C.S. House Physician appointment to follow if desired.

Apply Secretary, Redhill Hospital Management Committee, "Earlswood Mount," Redhill, Surrey.

RYDE. ROYAL I.W. COUNTY HOSPITAL. Isle of WIGHT GROUP HOSPITAL MANAGEMENT COMMITTEE. HOUSE SURGEON required for pre-registration post (salary £425 or £475 according to experience) or at Senior House Officer grading if registered (salary £745). Appointment recognised for F.R.C.S. Vacant late January.

Applications, with names of 2 referees, to Hospital Secretary immediately.

ROMFORD, ESSEX. OLDCHURCH HOSPITAL. (722 Beds.) SENIOR HOUSE OFFICER (neurosurgery) required immediately. Suitable for candidates seeking higher medical or surgical qualifications. Recognised for the F.R.C.S. (Eng.).

Apply to Secretary, Romford Group Hospital Management Committee, Oldchurch Hospital, Romford, as soon as possible.

ROMFORD, ESSEX. OLDCHURCH HOSPITAL. (722 Beds.) SENIOR HOUSE OFFICER (resident or non-resident) required for duties in the Casualty Department. Available for Male or Female applicants. This is a large General Hospital with specialised departments dealing with all types of acute medical and surgical cases. The post affords good opportunity for gaining tuition and experience.

Applications should be forwarded immediately to the Group Secretary, Romford Group Hospital Management Committee, Oldchurch Hospital, Romford.

ROMFORD, ESSEX. RUSH GREEN HOSPITAL. (301 Beds.) RESIDENT HOUSE OFFICER (general surgery) required immediately. Post is recognised for pre-registration purposes and for F.R.C.S.

Applications should be forwarded immediately to Medical Superintendent stating also names of 2 referees.

ROMFORD, ESSEX. VICTORIA HOSPITAL. (99 Beds.) RESIDENT HOUSE SURGEON (Male) required immediately. Post not approved for pre-registration purposes.

Applications should be forwarded immediately to the Secretary, Romford Group Hospital Management Committee, Oldchurch Hospital, Romford.

ROCHDALE AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. HOUSE SURGEON required immediately at the Rochdale Infirmary, pre- or post-registration applicants eligible. Post recognised for F.R.C.S.

Apply at once to Group Secretary, Central Offices, Birch Hill Hospital, Rochdale.

ROCHDALE AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE, BIRCH HILL HOSPITAL. HOUSE OFFICER (obstetrics and gynæcology) post vacant late February. Pre-registration post of 6 months duration. Recognised for D.Obst.R.C.O.G.

Apply to Group Secretary, Central Offices, Birch Hill Hospital, Rochdale, at once.

ROCHDALE INFIRMARY. Senior House Officer (anæsthetics) required.

Applications, with names and addresses of 2 referees and full particulars, to Group Secretary, Central Offices, Birch Hill Hospital, Rochdale, Lancs, as soon as possible.

ROCHDALE GROUP OF HOSPITALS invites applications from newly qualified medical practitioners for 1 year rotating PRE-REGISTRATION posts. The first 6 months will be spent as House Surgeons in the Rochdale Infirmary (2 months casualty, 4 months general surgery) and the second 6 months as House Physicians or Obstetric and Gynæcological House Surgeons. 3 posts vacant shortly.

Immediate applications to Group Secretary, Central Offices, Birch Hill Hospital, Rochdale.

ROCHFORD, ESSEX. GENERAL HOSPITAL. (622 Beds.) SENIOR HOUSE OFFICER required for Geriatric Unit at the above Hospital. Post vacant 1st February, 1957. A wide range of facilities are available at the Hospital for the investigation, treatment and rehabilitation of acute and chronic cases.

Applications, stating age, &c., to be sent to the undersigned as soon as possible. J. C. FIELD, Secretary.

SHEFFIELD, 6. MIDDLEWOOD HOSPITAL. (2000 Beds.) SHEFFIELD NO. 2 HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from Male officers for the appointment of JUNIOR HOSPITAL MEDICAL OFFICER or SENIOR HOUSE OFFICER at Middlewood Mental Hospital. Living quarters and residential services are available for single officers. There are good facilities for postgraduate study for the D.P.M. and there is full collaboration with the general hospital situate in the same grounds. Excellent laboratory and other special departments. Extensive psychiatric outpatient service.

Applications, stating age, qualifications and experience, together with names and addresses of 2 referees, should be forwarded immediately to the Medical Superintendent.

SHEFFIELD. NETHER EDGE HOSPITAL. Applications are invited for the resident post of SENIOR HOUSE OFFICER. Main duties will be in connection with the Maternity Unit but will also be required to assist in the wards for long-stay medical cases. Small flat available on rental.

Apply, giving full details of age, qualifications, present and previous appointments with dates and the names of 2 persons for reference, to the Group Secretary, Nether Edge Hospital, Sheffield. 11.

SHREWSBURY. ROYAL SALOP INFIRMARY AND COPTHORNE HOSPITAL. (500 Beds.) RESIDENT ANÆSTHETIST (Senior House Officer). Post recognised for F.F.A.R.C.S. Registrar also employed. Vacant end of January.

Applications and copy testimonials to Group Secretary, Shrewsbury Hospital Group, Royal Salop Infirmary, Shrewsbury.

SHREWSBURY. ROYAL SALOP INFIRMARY/COPTHORNE HOSPITAL. (500 Beds.) HOUSE SURGEON, vacant 1st March, 1957. Pre-registration candidates eligible. Recognised for the F.R.C.S.

Applications, with copy testimonials, to Group Secretary, Shrewsbury Hospital Group, Royal Salop Infirmary, Shrewsbury.

SIDCUP AND SWANLEY HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER (casualty and orthopædic) required. The successful applicant will serve 3 months in the Orthopædic Department and 3 months as Casualty Officer. The post is recognised under the Fellowship regulations as a period of 6 months casualty training.

Applications, stating age, qualifications and experience, together with names and addresses of 2 referees, should be sent to Secretary, Queen Mary's Hospital, Sidcup, Kent.

SLOUGH, BUCKINGHAMSHIRE. UPTON HOSPITAL. WINDSOR GROUP HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER (casualty), required, working with Registrar in busy Casualty Department. Experience provided in orthopædic and plastic cases.

Applications, with names of 2 referees, to Hospital Secretary.

SOUTHAMPTON GENERAL HOSPITAL. (472 Beds.) RESIDENT HOUSE PHYSICIAN required beginning March. Pre-registration candidates eligible.

Applications, with copies of testimonials, should be forwarded as soon as possible to the Group Secretary, Southampton Group Hospital Management Committee, Bullar-street, Southampton.

SOUTHAMPTON. ROYAL SOUTH HANTS HOSPITAL. (278 Beds.) RESIDENT HOUSE SURGEON required beginning February. Pre-registration candidates eligible.

Applications, with copies of recent testimonials, should be forwarded to Group Secretary, Southampton Group Hospital Management Committee, Bullar-street, Southampton.

SOUTHEND-ON-SEA GENERAL HOSPITAL. Applications are invited from registered medical practitioners for the appointment of CLINICAL ASSISTANT in Dermatology to undertake 2 sessions per week at the above Hospital. The successful applicant will work under the general direction of the Consultant Physician for diseases of the skin attached to the Southend Hospitals Group. Previous experience in dermatology is desirable. Payment will be at the rate of £175 p.a. per weekly 3½ hour notional half-day. The appointment will be held for 1 year (renewable) and duties will commence as soon as possible.

Applications, stating age, qualifications and experience, with names and addresses of 2 referees, should be sent to the undersigned at the Hospital not later than 2nd February, 1957.

J. C. FIELD, Secretary.

SWANSEA HOSPITAL, Swansea. (403 Beds.) **Glantawe** HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of Pre-registration HOUSE OFFICER in the Surgical Unit of the above Hospital. Immediate vacancy.

Applications with full particulars should be addressed to the Hospital Secretary. T. E. JONES, Group Secretary.

SWANSEA HOSPITAL, Swansea. (403 Beds.) **Glantawe** HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners for the appointment of CASUALTY OFFICER of Junior Hospital Medical Officer grade, at the above Hospital. Vacancy 8th February, 1957.

Full particulars, stating age, qualifications and experience, together with copies of recent testimonials, should be forwarded to the Hospital Secretary. T. E. JONES, Group Secretary.

SCOTLAND. NORTHERN REGIONAL HOSPITAL BOARD. Applications are invited for the whole-time resident post of REGISTRAR in Psychiatry at Craig Dunain Hospital, Inverness.

Forms of application and further particulars may be obtained from the undersigned with whom applications should be lodged by 11th February, 1957.

A. M. FRASER, M.D.,
Secretary and Administrative Medical Officer.
Office of the Northern Regional Hospital Board,
Raigmore, Inverness.

SCOTLAND. SOUTH-EASTERN REGIONAL HOSPITAL BOARD. REGISTRAR in Orthopædic Surgery to the West Fife Group of hospitals, based on the Dunfermline and West Fife Hospital.

Apply, giving particulars of age, qualifications and previous experience, and the names of 2 referees, to the Secretary, 11, Drumsheugh-gardens, Edinburgh, 3, by 16th February, 1957.

SCOTLAND. WESTERN REGIONAL HOSPITAL BOARD. Applications are invited for the following appointments, which will be for 1 year in the first instance :—

SENIOR REGISTRAR in Surgery based in the first instance at Hairmyres Hospital, East Kilbride.

SENIOR REGISTRAR in Surgery based in the first instance at Law Hospital, Carluke.

Applications (12 copies), stating date of birth, qualifications, experience, present appointment, and the names of 3 referees, to reach the Secretary, Western Regional Hospital Board, 64, West Regent-street, Glasgow, C.2, by 9th February, 1957.

SCOTLAND. WESTERN REGIONAL HOSPITAL BOARD. Applications are invited for appointments as REGISTRARS in the following specialties based at the undernoted hospitals. These appointments will be for 1 year in the first instance.

Medicine
Glasgow Royal Infirmary—3 vacancies.
Glasgow Western Infirmary—1 vacancy.
Glasgow Victoria Infirmary—1 vacancy.
Southern General Hospital—1 vacancy.
Gartloch Hospital—1 vacancy.
Stirling Royal Infirmary—1 vacancy.

Surgery
Glasgow Royal Infirmary—2 vacancies.
Glasgow Western Infirmary—4 vacancies.
Glasgow Victoria Infirmary—1 vacancy.
Southern General Hospital—1 vacancy.
Royal Alexandra Infirmary, Paisley—1 vacancy.
Ayr County Hospital—1 vacancy.

Anæsthetics
Stobhill Hospital—1 vacancy.
Victoria Infirmary—1 vacancy.
Southern General Hospital—1 vacancy.

E.N.T. Surgery
Glasgow Ear, Nose and Throat Hospital—1 vacancy.
Stobhill Hospital—1 vacancy.
Victoria Infirmary—1 vacancy.
Southern General Hospital—1 vacancy.
Western Infirmary—1 vacancy.

Ophthalmology
Glasgow Eye Infirmary—1 vacancy.

Obstetrics and Gynæcology
Glasgow Royal Infirmary/Maternity Hospital—1 vacancy.
Western District Hospital—1 vacancy.
Bellshill Maternity Hospital—1 vacancy.
Cresswell Maternity Hospital, Dumfries—1 vacancy.

Dentistry
Glasgow Dental Hospital—1 vacancy.

Dermatology
Stobhill Hospital, Glasgow—1 vacancy.

Orthopædic Surgery
Western Infirmary, Glasgow—1 vacancy.

Pædiatrics
Stobhill Hospital, Glasgow—1 vacancy.

Pathology
Dumfries and Galloway Royal Infirmary—1 vacancy.

Psychiatry
Stobhill Hospital, Glasgow—1 vacancy.

Radiology
Western Infirmary, Glasgow—1 vacancy.

Applications (12 copies), stating date of birth, qualifications, experience, present appointment and the names of 3 referees, to reach the Secretary, Western Regional Hospital Board, 64, West Regent-street, Glasgow, C.2, by 9th February, 1957. Candidates should state, in order of preference, the posts for which they wish to apply.

ST. HELENS AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. ST. HELENS HOSPITAL. (196 Beds.) Applications are invited for the appointment of RESIDENT HOUSE SURGEON, which becomes vacant from 1st March, 1957. The post is recognised for Pre-registration Service.

Applications, stating age, date of qualification and experience and giving 2 names for reference, should be forwarded to—

N. RICHARDS, Group Secretary.
Whiston Hospital, Prescot, Lancs.

STAFFORD. STAFFORDSHIRE GENERAL INFIRMARY. RESIDENT CASUALTY OFFICER (Junior Hospital Medical Officer status) required. Male or Female.

Applications, stating age, previous experience and copies of 2 recent testimonials, to the Group Secretary, Stafford Hospital Management Committee, 13, Foregate-street, Stafford.

STIRLING AND CLACKMANNAN HOSPITALS BOARD OF MANAGEMENT. RESIDENT HOUSE SURGEON (pre-registration) at Clackmannan County Hospital. Post vacant 1st February, 1957.

Applications should be sent to the Group Medical Superintendent, Royal Infirmary, Stirling.

STOKE-ON-TRENT. CITY GENERAL HOSPITAL. (845 Beds. Recognised for F.F.A.R.C.S. and D.A.) STOKE-ON-TRENT HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER in Anæsthetics. Post vacant 1st April, 1957. Previous anæsthetic experience desirable, but not essential. The post offers experience in anæsthesia for all types of general surgery, thoracic and cardiac surgery, including an Obstetric Unit of 60 Beds. Staff includes a Senior Registrar who shares in emergency duties.

Applications, with copy testimonials, to the Group Secretary, Stoke-on-Trent Hospital Management Committee, Princes-road, Stoke-on-Trent.

STOKE-ON-TRENT. CITY GENERAL HOSPITAL. HOUSE OFFICER (general surgery) required. Pre-registration post. Hospital recognised for F.R.C.S.

Detailed applications, with copy testimonials, to Group Secretary, Hospital Management Committee, Princes-road, Stoke-on-Trent.

STOKE-ON-TRENT. CITY GENERAL HOSPITAL. SENIOR HOUSE OFFICER (pædiatrics) required. Post vacant 1st April. Recognised D.C.H.

Applications, with copy testimonials, to Group Secretary, Princes-road, Stoke-on-Trent, as soon as possible.

STOKE-ON-TRENT. CITY GENERAL HOSPITAL. HOUSE OFFICER (pædiatrics) required. Post vacant 10th March. Pre-registration. Hospital recognised for D.C.H.

Detailed applications, with copy testimonials, to Secretary, Hospital Management Committee, Princes-road, Stoke-on-Trent.

STOKE-ON-TRENT. NORTH STAFFORDSHIRE ROYAL INFIRMARY. (455 Beds.) SENIOR HOUSE OFFICER in Orthopædics. Recognised F.R.C.S.

Applications, with names of 2 referees, to Group Secretary, Hospital Management Committee, Princes-road, Stoke-on-Trent.

STOKE-ON-TRENT. NORTH STAFFORDSHIRE ROYAL INFIRMARY. HOUSE OFFICER (general surgery) required. Pre-registration post. Hospital recognised for F.R.C.S.

Detailed applications, with copy testimonials, to Group Secretary, Hospital Management Committee, Princes-road, Stoke-on-Trent.

TAPLOW, near MAIDENHEAD. CANADIAN RED CROSS MEMORIAL HOSPITAL. OBSTETRICAL AND GYNÆCOLOGICAL REGISTRAR required at above Hospital. Post recognised for M.R.C.O.G.

Application forms from, and returnable to, Secretary, Windsor Group Hospital Management Committee, Alma-road, Windsor, by 3rd February.

TUNBRIDGE WELLS (near). PEMBURY HOSPITAL, PEMBURY. (385 Beds.) TUNBRIDGE WELLS GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications invited for appointment of HOUSE SURGEON (Senior House Officer) to Orthopædic Unit. Post vacant early February, 1957; recognised for F.R.C.S. (Eng.) and tenable for 1 year. Work includes treatment of long and short stay cases and traumatic surgery with large outpatient and fracture clinics.

Apply, stating age, qualifications and experience, with 3 testimonials, to Group Secretary, Sherwood Park, Tunbridge Wells.

WAKEFIELD. PINDERFIELDS GENERAL HOSPITAL. Fully registered HOUSE OFFICER required for the Gynæcological Department. £525 p.a. Residential accommodation at charge of £125 p.a.

Address written applications, giving full particulars of experience, &c., and 2 names and addresses for reference, to—

W. BOWRING, Group Secretary.

Victoria Chambers, Wood-street, Wakefield.

WATFORD, HERTFORDSHIRE. PEACE MEMORIAL HOSPITAL. Applications are invited for the post of RESIDENT ANÆSTHETIST (Senior House Officer grade) to the Watford Hospitals.

Applications, together with copies of not more than 2 recent testimonials, to the Administrator.

WATFORD, HERTFORDSHIRE. PEACE MEMORIAL HOSPITAL. CASUALTY OFFICER (Senior House Officer). Modern Department employing 3 full-time Casualty Officers. Post recognised for F.R.C.S. Resident or non-resident. Vacant mid-February.

Applications, with names of 2 referees, to the Administrator.

WATFORD, HERTFORDSHIRE. PEACE MEMORIAL HOSPITAL. (208 Beds.) Applications are invited for the post of HOUSE SURGEON at the above Hospital. This is a pre-registration post and is recognised for F.R.C.S. Salary according to the National Health Service scale.

Applications, with copies of recent testimonials, to the Administrator.

WINDSOR. KING EDWARD VII HOSPITAL. Obstetric AND GYNÆCOLOGICAL HOUSE SURGEON required, Male or Female, for post vacant 20th February. Post recognised for both M.R.C.O.G. and D.Obst.R.C.O.G. Not a pre-registration post. Successful candidate will be resident at Old Windsor Unit of Hospital.

Applications, stating age, nationality, qualifications with dates, and copies of recent testimonials or names of 3 referees, to Secretary by 1st February.

WINCHESTER. ROYAL HAMPSHIRE COUNTY HOS-PITAL. (315 Beds.) HOUSE SURGEON to the Senior Surgeon. Post vacant immediately.

Applications, with copies of 2 testimonials, to be sent to the Group Secretary.

WINCHESTER. ROYAL HAMPSHIRE COUNTY HOS-PITAL. (315 Beds.) HOUSE PHYSICIAN (post-registration) to the Pædiatric Department, vacant 18th March. Preference will be given to applicants wishing to specialise in pædiatrics. The department is recognised for the D.C.H.

Applications, with copies of 2 testimonials, to the Group Secretary.

WINCHESTER. ROYAL HAMPSHIRE COUNTY HOS-PITAL. (315 Beds.) HOUSE SURGEON (post recognised by Royal College of Surgeons) required for general surgery with some E.N.T. duties. Approved pre-registration post. Vacant 27th February.

Applications, with copies of 2 testimonials, to the Group Secretary.

WIGAN AND LEIGH HOSPITAL MANAGEMENT COMMITTEE. JUNIOR HOSPITAL MEDICAL OFFICER required for geriatric duties under direction of Consultant Geriatrician. Non-resident or resident post (furnished married quarters available at Atherleigh Hospital). Vacant 1st March, 1957. Main duties in connection with geriatric beds at various hospitals in the group—possibility of a small amount of acute medical work.

Applications, giving full details of experience, together with the names of 2 referees, to Secretary, Knowsley House, Wigan, by 31st January, 1957.

WESTON-SUPER-MARE GENERAL HOSPITAL. CASUALTY OFFICER (Senior House Officer grade) required 1st February, 1957, for the above Hospital. The appointment is recognised for F.R.C.S. examinations.

Applications, stating age, qualifications, and experience, together with the names and addresses of 2 referees, should be addressed to the Group Secretary, Weston-super-Mare Hospital Management Committee.

WOLVERHAMPTON GROUP. Royal Hospital, Wolver-HAMPTON. REGISTRAR in Orthopædic and Traumatic Surgery required. All types of traumatic and orthopædic conditions, also industrial accident work and rehabilitation which is carried out at a special unit of 60 Beds.

Applications, giving full particulars of age, qualifications and experience, by 9th February, to Group Secretary, Royal Hospital, Wolverhampton.

WOLVERHAMPTON. THE ROYAL HOSPITAL. (An Associated Hospital of the Birmingham University Medical School.) HOUSE OFFICER (pre-registration), E.N.T. Department, vacant February.

Apply Secretary, with copies of testimonials.

WORCESTER. RONKSWOOD HOSPITAL. Senior HOUSE OFFICER in General Surgery required immediately. Post recognised for F.R.C.S. examination.

Applications to Hospital Secretary.

WORCESTER ROYAL INFIRMARY. (213 Beds.) House SURGEON (pre-registration or otherwise) for Orthopædic Department required immediately. Post recognised for F.R.C.S. examinations.

Applications to Secretary.

CANADA. OTTAWA CIVIC HOSPITAL, Ottawa (general—800 Beds), invites applications to fill an appointment as RESIDENT in Medical Department. This is a senior appointment for a man who proposes to write Fellowship examinations in Canada in the field of internal medicine and the appointment involves teaching of final year medical students and graduate interns. Salary $200 per month, plus room and board.

Applications, stating age, qualifications, experience, and names of 2 referees, should be forwarded to Superintendent, Ottawa Civic Hospital, Ottawa, Canada.

CANADA. REDDY MEMORIAL HOSPITAL, Tupper-street, WESTMOUNT, MONTREAL. British graduates required as JUNIOR INTERNES from June, 1957. Salary $100 per month, with full board and lodging. Also; RESIDENT in Medicine, Salary $225.

Apply: Executive Director.

CANADA. REGINA GENERAL HOSPITAL, Regina, SASKATCHEWAN. Vacancies exist for appointments as RESIDENT and ASSISTANT RESIDENT in Services of Pathology, Pædiatrics and Obstetrics/Gynæcology in 800-Bed General Hospital. All services very active. Stipend of $175 per month for Assistant Resident; $225 for Resident. Full maintenance provided.

Apply Superintendent, Regina General Hospital, Regina, Saskatchewan.

NEW YORK. ALBANY HOSPITAL, Albany, New York, U.S.A. PSYCHIATRY RESIDENCIES available in 655-Bed University-teaching General Hospital with 60-Bed acute treatment Psychiatric Unit fully approved for 3 years training. Experience includes dynamically-oriented psychotherapy with children and adults, shock therapies, and neurologic training. Salary range $3000–$4000 annually.

Address inquiries to Medical Director.

NEW YORK. NEW ROCHELLE HOSPITAL, New ROCHELLE, NEW YORK, U.S.A. (360-Bed general community hospital.) Approved by the Joint Commission on Accreditation of Hospitals. Also approved by the American College of Surgeons and American Medical Association for Internship and Residency training. Only graduates from approved university schools accepted. INTERNESHIPS available for the 1 year term commencing 1st July, 1957. Stipend is $200 per month plus complete maintenance. Passage back to England paid by Hospital after completion of 12-month Internship.

Apply Superintendent.

U.S.A. ELMHURST GENERAL HOSPITAL, Elmhurst, NEW YORK, U.S.A. (960 Bed general municipal hospital, formerly New York City Hospital.) Approved by the Joint Commission on Accreditation of Hospitals. Also approved by the American College of Surgeons and American Medical Association for Internship and Residency training. Only graduates from approved university schools accepted. Several openings in Rotating and Straight INTERNESHIPS and a few first and second year RESIDENCIES are available for the term commencing 1st July, 1957. Stipend for Internes is $855 per year plus complete maintenance.

Apply to Chairman of Interne and Resident Committee.

IBADAN, NIGERIA. UNIVERSITY COLLEGE HOSPITAL. The Board of Management invites applications from registered medical practitioners for appointment either as SENIOR REGISTRAR or REGISTRAR (tuberculosis) in the Department of Medicine in the almost completed Teaching Hospital. Candidates should have experience in general medicine. Applicants for the Senior Registrar appointment must hold a higher qualification and should have experience in tuberculosis work.

The successful candidate will work under 1 of the Physicians. He will be responsible for the care of inpatients in the tuberculosis and thoracic ward, which will be opened during the next few months and will be a combined medical and surgical unit. He will also take part in the outpatient investigation and treatment of all forms of tuberculosis and chest diseases. The teaching hospital unit will be closely associated with a new clinic which is being built in Ibadan for the large scale treatment of tuberculosis in the city. The post offers exceptional opportunities for experience in many aspects of tuberculosis in the tropics and for research into the varied problems involved.

The salary offered for the post is :—

Senior Registrar—£1428 p.a. rising by 3 annual increments to a maximum of £1596 p.a.

Registrar—first year £1164 p.a., second year £1212 p.a.

The appointment will be initially for 1 tour of 12 months and will be renewable by mutual agreement.

An inducement allowance of £300 p.a. is payable to expatriate officers in the case of a Senior Registrar and £270 p.a. for a Registrar.

On satisfactory completion of the agreement, a gratuity of £37 10s. will be paid for each completed period of 3 months service.

An outfit allowance of £60 is payable on first appointment. Partly furnished quarters are provided at a rental of 8½% of salary, excluding inducement allowance. Children's allowances are payable.

Free first-class passages to and from Nigeria are provided for an expatriate doctor and his wife on first appointment and on completion of agreement. Free first-class passages to Nigeria will, in certain circumstances, be provided for Nigerian doctors on first appointment. Both expatriate and Nigerian doctors are eligible for leave at the rate of 7 days for each completed month of service, with free first-class passages to and from the United Kingdom.

Arrangements can be made to enable doctors to continue their contributions to the National Health Service superannuation scheme. Details of the revised salary and gratuity payable in such circumstances will accompany application forms.

Applications should be submitted not later than 9th February, 1957, on the appropriate forms, which will be forwarded, together with additional information, on receipt of an addressed foolscap envelope, by the Adviser on Staff Recruitment, London Office, University College Hospital, Ibadan, 57, Catherine-place, London, S.W.1.

IBADAN, NIGERIA. UNIVERSITY COLLEGE HOSPITAL. The Board of Management invite applications from experienced medical practitioners for the appointments of SENIOR REGISTRAR and REGISTRAR (Department of Anæsthetics) in the almost completed teaching Hospital.

Applicants for the post of Senior Registrar must possess D.A. or have obtained the primary for F.F.A.R.C.S. and must have had wide experience of modern anæsthesia including anæsthesia for thoracic surgery.

The salary offered for the post of Senior Registrar is £1428 p.a. rising by 3 increments to £1596 p.a. plus an inducement addition payable to an expatriate officer of £300 p.a.

Applicants for the post of Registrar (1 of 3) should possess or be eligible to take the D.A. or primary F.F.A.R.C.S.

The salary offered for the post of Registrar is £1164 p.a. for the first year and £1212 p.a. for the second year, plus an inducement addition, payable to an expatriate officer of £270 p.a.

The appointments will be initially for 1 tour of 12 months and will be renewable by mutual agreement for a further tour of 12 months.

On satisfactory completion of the agreement a gratuity of £37 10s. will be paid for each completed term of 3 months service.

An outfit allowance of £60 is payable on first appointment. Partly furnished quarters are provided at a rental of 8½% of salary excluding inducement allowance and the officer appointed will be eligible for 7 days leave on full pay for each completed month of service in Nigeria.

Free first-class passages are provided for expatriate doctors and their wives on first appointment and on completion of the agreement. Free first-class passages to Nigeria will, in certain circumstances, be provided for non-expatriate doctors. Free first-class passages will be provided for vacation leave.

Candidates will be eligible for children's allowances in accordance with existing regulation.

Arrangements can be made to enable doctors to continue their National Health Service superannuation scheme contributions, and details of the revised salary and gratuity payable in such cases will accompany application forms.

Applications should be submitted not later than 9th February, 1957, on the appropriate forms, which will be forwarded, together with additional information, on receipt of an addressed foolscap envelope by the Adviser on Staff Recruitment, London Office, University College Hospital, Ibadan, 57, Catherine-place, Palace-street, London, S.W.1.

Public Appointments

DUBLIN. LOCAL APPOINTMENTS COMMISSION. CARDIOLOGIST (part-time), Galway County Council. Essential qualifications include M.D., M.R.C.P.I., or equivalent. Salary £543.

Application forms and particulars from the Secretary, 45, Upper O'Connell-street, Dublin. Latest time for receiving completed application forms 5 P.M. on 8th February, 1957.

BUCKS COUNTY COUNCIL. Applications are invited from registered medical practitioners for the appointment of ASSISTANT COUNTY MEDICAL OFFICER in the Mid-Bucks area based on Aylesbury. Preference will be given to applicants possessing a Diploma in Public Health or a Diploma in Child Health, and experience in maternity, school medical, and child welfare work. Salary within the scale of £1050–£1475 p.a. Travelling and subsistence allowances on the County Council's scale will be paid. The appointment is superannuable and subject to medical examination.

Further particulars and forms of application may be obtained from the County Medical Officer, County Offices, Aylesbury, to whom completed applications must be returned by 2nd February, 1957. R. E. MILLARD, Clerk of the Bucks County Council.

County Hall, Aylesbury, January, 1957.

FACTORY DOCTORS. Factories Acts, 1937 and 1948. The following appointments as Appointed Factory Doctor are vacant. Apply to Chief Inspector of Factories, 19, St. James's-square, London, S.W.1.

District	*County*	*Latest date for receipt of applications*
SOMERTON	.. SOMERSET	.. 9TH FEBRUARY, 1957
LONG SUTTON	.. LINCOLN	.. 9TH FEBRUARY, 1957

GOVERNMENT OF NORTHERN IRELAND. Civil SERVICE COMMISSION. Applications are invited for the post of MEDICAL OFFICER in the Ministry of Health and Local Government. Subject to a probationary period of 2 years, the post will be permanent and pensionable. Candidates must be registered medical practitioners, preferably of at least 10 years standing, with a wide experience of general practice and a sympathetic understanding of the problems of general practitioners working under the Health Services Scheme. Preference will be given to candidates who have also had experience in public health or hospital work. The consolidated salary scale is £1600 p.a. rising by annual increments to £2200. The minimum of the scale is linked to age 35, minus £50 for each year below that age, and plus 1 increment for each year above that age, subject to a maximum entry point of £2000. Exceptionally, a candidate age 40 or over on entry may receive starting pay above £2000 according to qualifications and experience. Preference will be given to suitably qualified candidates who served in H.M. Forces during the 1914–18 or 1939–45 wars, provided the Commissioners are satisfied that such candidates are, or within a reasonable time will be, able to discharge the duties efficiently.

Application forms and further particulars may be obtained from the Secretary, Civil Service Commission, Stormont, Belfast; completed application forms, together with copies of 2 recent testimonials, must be returned so as to reach the Secretary not later than 26th February, 1957.

KINGSTON UPON HULL. CITY AND COUNTY OF KINGSTON UPON HULL. Applications are invited for the appointment of SENIOR MEDICAL OFFICER on the staff of the Health Department. The Officer appointed will be responsible for the coördination of all the care and aftercare schemes of the Department including vaccination and immunisation, mental health, sociological investigation, recuperative holidays, &c. In addition the Officer will be given an opportunity of gaining experience in Port Health Administration. The salary scale (£1520–£50(1)–£55(7)–£1955 p.a.) and conditions of service will be in accordance with the appropriate Whitley Council agreements, and the Officer will receive an essential user car allowance.

Particulars of the appointment and forms of application may be obtained from the Medical Officer of Health, Guildhall, Kingston upon Hull, to whom completed application forms must be returned not later than 11th February, 1957.

MANCHESTER. CITY OF MANCHESTER. Health DEPARTMENT. MEDICAL OFFICER required for administrative and clinical public health duties in the General Services Division of the Health Department. The medical officer appointed will be a member of the staff of the central administrative section and will have excellent opportunities of gaining experience in the general administration of the Public Health Service. Previous experience of public health work is essential. Salary £1050–£1475; Medical Council "C" conditions of service.

Application forms, returnable by 2nd February, 1957, from the Town Clerk, Town Hall, Manchester, 2.

STATE OF QUEENSLAND, Australia. Appointments to Medical Staff. Applications, addressed to the Agent-General for Queensland, 409/410, Strand, London, and closing on 1st March, 1957, are invited from duly qualified medical practitioners of Great Britain and Northern Ireland for appointment to positions as JUNIOR MEDICAL OFFICER in Queensland hospitals. Successful applicants will be given limited registration if they have not completed their full hospital year after graduation: otherwise full registration will be granted. The salary for a graduate in the first year after graduation is A£1272 p.a. Board and lodging provided free.

Applications should include particulars of marital status, age, experience and date available, together with copies of testimonials.

PROVINCE OF NOVA SCOTIA, CANADA

PATHOLOGIST

Applications are invited from qualified Pathologists for the position of Director of the Cape Breton Branch Laboratory. This is a recently constructed branch of the Province Laboratory and is situated in a 235-Bed general hospital in Sydney, Nova Scotia. Salary $10,000–$12,000 p.a.

Further information concerning duties and living conditions may be obtained from Dr. W. A. TAYLOR, 62 University-avenue, Halifax, Nova Scotia, Canada, to whom applications, with names of 2 referees, should be submitted in duplicate.

STOKE-ON-TRENT. CITY OF STOKE-ON-TRENT. Applications are invited for the appointment of SENIOR MEDICAL OFFICER (maternal and child welfare) from registered medical practitioners (Women) holding a Diploma in Public Health, and having had extensive experience in maternal and child welfare, and general public health work. The salary will be on the Whitley Council scale £1520–£50–£55(7)–£1955. The person appointed will be responsible, under the direction of the Medical Officer of Health, for carrying out the administrative duties of the maternal and child welfare section of the Public Health Department, and any such duties as the Medical Officer of Health may from time to time determine. The appointment will be subject to the provisions of the National Health Services (Superannuation) Regulations, 1947, and the successful candidate will be required to pass a medical examination.

Applications (no forms) in envelopes endorsed "Senior Medical Officer (Maternal and Child Welfare)," together with copies of 3 recent testimonials or names of 3 referees, to be delivered to the Medical Officer of Health, Public Health Department, St. Peter's Chambers, Glebe-street, Stoke-on-Trent, not later than Tuesday, 5th February, 1957.

HARRY TAYLOR, Town Clerk.

YORKSHIRE. COUNTY COUNCIL OF THE WEST RIDING OF YORKSHIRE. Joint appointment of SENIOR ASSISTANT COUNTY MEDICAL OFFICER AND SCHOOL MEDICAL OFFICER to the Cudworth, Darton, Darfield, Dodworth, Royston, Wombwell, and Worsborough Urban District Councils and the West Riding County Council. Applications are invited from registered medical practitioners, Men or Women, for the above post. The Senior Assistant County Medical Officer and School Medical Officer will be on the staff of the County Medical Officer's Department but will work under the administrative direction of the Divisional Medical Officer and the Medical Officer of Health, who is responsible for the day-to-day administration of practically all public health matters in the Division. The duties of the office will be mainly clinical in the School Health and Infant Welfare Services, but in addition to these duties the person appointed will be required to act for the Divisional Medical Officer and Medical Officer of Health in his absence, and will be appointed as Deputy Medical Officer of Health to the constituent Authorities. Candidates must be in possession of the D.P.H. or be nearing completion of training for the D.P.H. The scale of salary is at present £1150–£1575 p.a. Travelling and subsistence allowances according to the County Council's scale are payable in addition to salary. The post is superannuable and the successful applicant will be required to pass a medical examination as to physical fitness.

Forms of application can be obtained from the undersigned to whom they should be returned not later than 9th February, 1957. J. WOOD-WILSON, County Medical Officer.

County Hall, Wakefield.

YORKSHIRE. COUNTY COUNCIL OF THE WEST RIDING OF YORKSHIRE. Applications are invited from registered medical practitioners, Men or Women, for the post of ASSISTANT COUNTY MEDICAL OFFICER AND SCHOOL MEDICAL OFFICER in the Settle Division of the County, comprising the Bowland, Sedbergh, and Settle Rural Districts. The Assistant will be on the staff of the County Medical Officer's Department, but will work under the administrative direction of the Divisional Medical Officer for the area. The scale of salary is £1050–£1475 p.a. Re-designation of the post to that of Senior Assistant County Medical Officer and School Medical Officer with a salary range of £1150–£1575 p.a. is at present under consideration, and applicants must be in possession of the D.P.H., or be nearing the completion of training for the D.P.H. Travelling and subsistence allowances according to the County Council's scale are payable in addition to salary. The post is superannuable and the successful applicant will be required to pass a medical examination as to physical fitness.

Forms of application can be obtained from the undersigned, to whom they should be returned not later than 9th February, 1957. J. WOOD-WILSON, County Medical Officer.

County Hall, Wakefield.

General Practice

For an Executive Council post (England and Wales) apply on form E.C.16A obtainable from the council. Mark envelope "Vacancy."

CANTERBURY, KENT. Applications invited for Vacancy (urban). List at present approximately 2020. Residence and surgery available. Apply on E.C.16A before 9th February, 1957, to—

F. E. MILES, Clerk, Kent and Canterbury Executive Council.
11, Station-road, Maidstone.

EAST SUSSEX EXECUTIVE COUNCIL. Rural Vacancy due to withdrawal from Medical List on 31st March, 1957, of husband and wife. Combined lists 2000. Residence, including surgery, for sale. Apply on Form E.C.16A to Clerk, East Sussex Executive Council, Castlegate, Lewes. Completed forms must be received by 8th February.

Hospital Services : Non-Medical Appointments

DONCASTER HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from suitably qualified persons for the post of BIOCHEMIST (Basic grade) at Doncaster Royal Infirmary. Candidates should possess a science degree.

Applications, stating age, education, qualifications, experience and present position, together with the names of 3 referees, should be forwarded to reach the undersigned not later than 10th February, 1957.

Doncaster Royal Infirmary. A. JONES, Group Secretary.

Miscellaneous

Assistant Medical Officer required by Pilkington Brothers Limited to assist in the Company's industrial medical service which is located at St. Helens, Lancashire. The service includes a Rehabilitation Scheme with a Transitional Workshop. Applicants, who should preferably have had casualty experience, should state age, qualifications, and previous experience. Salary according to B.M.A. scale. Company house to rent available. —Applications should be addressed to the Group Personnel Officer, PILKINGTON BROTHERS LIMITED, St. Helens, Lancashire.

An Industrial Medical Officer is required by the Birfield Group of Companies to serve as Medical Officer to several of its companies in the Birmingham area. The post calls for a man who has a vocational interest in occupational health and who is prepared to devote his activities exclusively to this appointment. He will be required in each company to give advice on working conditions in relation to health and hygiene, to conduct medical examinations, to liaise with hospitals and other members of the medical profession, and to provide medical supervision of the nursing staffs in the various medical departments. There has not previously been a full-time Medical Officer in the Group and as there are considerable plans for the development of health services, some industrial experience is desired. The initial salary will be determined on the basis of qualifications and experience; it will in no case be less than £1400 and may be substantially more.—Applications are invited from men who are resolved to make a career of this type of work and they are asked to write, giving particulars of age, training, qualifications, and career to date, to the Senior Personnel Manager, HARDY SPICER LTD., Birch-road, Witton, Birmingham, 6.

May & Baker Ltd., Dagenham, Essex, chemical manufacturers. Applications are invited from Male registered medical practitioners aged about 30 years, for appointment as Assistant Works Medical Officer. Candidates should have a good clinical background and an interest in industrial medicine. The additional qualification of D.P.H. or D.I.H. is desirable but not essential. Salary according to B.M.A. scale. Contributory pension scheme.—Applications, giving full details of qualifications and experience, together with the names of 3 referees, should be sent to the Personnel Officer, quoting reference No. 28.

Malaya. A Resident Medical Officer is required for a Tin Mining Company, near Kuantan, East Coast of Malaya in the State of Pahang. Monthly salary at rate of Str. $1500–$100–$1700 on initial 3-year engagement. If married, a monthly allowance of Str. $150 is paid. Passages, furnished accommodation, home leave, pension scheme apply. Tropical, clinical and hygiene experience an advantage.

Applications with full particulars to Box No. 639, c/o CHARLES BARKER & SONS LTD., Gateway House, London, E.C.4.

Nchanga Consolidated Copper Mines Limited. A Surgeon is required by the above Company in Northern Rhodesia for a period of about 6 months from about the middle of May, 1957, to take the place of the Specialist Surgeon who will be on leave during that period. He will be required to work under the Chief Medical Officer of the Company which has both a European and African Hospital. The salary will be at the rate of £325 per month inclusive, part of which is deemed to be in lieu of private practice. Travelling expenses in both directions will be borne by the Company. Housing accommodation will be available.

Application forms can be obtained from Nchanga Consolidated Copper Mines Limited, 40, Holborn-viaduct, London, E.C.1.

Wanted, by well-established Clinic in Southern Alberta, a Pædiatrician, young man with D.C.H. preferred. State qualifications, and pertinent personal data.—Write, Address, No. 274, THE LANCET Office, 7, Adam-street, Adelphi, London, W.C.2.

Institute of Child Psychology Ltd., 6, Pembridge-villas, W.11. Honorary Child Psychiatrist required 2 sessions weekly. D.P.M. and experience in child psychiatry essential. Opportunity for those interested in new methods and research. 4 guineas per session.—Apply to the Secretary.

Information Officer required to create and maintain an information service and card index in the field of pharmaceuticals and general medicine. The candidate should hold a pharmaceutical or medical or other suitable qualification and preferably be experienced in the searching of medical and other relevant literature, and the writing up of surveys. This is an important post with good prospects for the right man. Pension and bonus schemes in operation. 5-day week.—Apply, Managing Director, BEECHAM RESEARCH LABORATORIES LTD., Brockham Park, Betchworth, Surrey.

Dental Surgeon requires room and use of waiting-room London or Suburbs.—Address, No. 273, THE LANCET Office, 7, Adam-street, Adelphi, London, W.C.2.

To Medical Societies, Hospital Committees, &c. A small Conference-room (20–30) is available in the centre of the London medical world, beautifully furnished with full service. Evenings only.—Apply: H. RICHARDS (MANAGEMENT) LTD., 30, New Cavendish-street, W.1 (Tel.: WELbeck 7561).

Typewriting and Duplicating. First-class work at moderate prices by experienced medical typists. Electric machines. —SYBIL RANG, 21, Heath-street, Hampstead, London, N.W.3 (HAM 5329/0504).

"Pregnancy Diagnosis by the Xenopus Method," 24-hour service. Send specimen of urine and £1 1s. fee. Hæmatology, Biochemistry, Flame Photometry.—WELBECK BIOLOGICAL LABORATORIES, 26, Park-crescent, Portland-place, W.1 (MUSeum 5386–7).

Applicants for posts requiring testimonials copied or duplicated should communicate with MANTON SECRETARIAL SERVICE LTD., 98, Victoria-street, S.W.1 (Phone: VICtoria 0141), who are specialists in this kind of work.

PUBLISHED by the PROPRIETORS, THE LANCET LIMITED, 7, Adam Street, Adelphi, in the County of London.
Printed by HAZELL, WATSON & VINEY, LTD., London and Aylesbury—Saturday, January 26, 1957.
PRINTED IN GREAT BRITAIN—Entered as Second Class at the New York, U.S.A., Office.

dispelling the element of doubt

TODAY—with so many antibiotics available—it is always sound practice to specify ACHROMYCIN *by name* whenever true broad-spectrum activity is desired. In this way you are completely assured that the patient receives precisely the treatment you intend. Offered now in no less than fourteen presentations, ACHROMYCIN tetracycline is particularly widely used in capsule form. On every capsule appears the name Lederle—your finest assurance of consistent antibiotic potency and unfailing dependability.

Capsules of 50 mg.—in vials of 25 and 100. Capsules of 250 mg.—in vials of 16 and bottles of 100 and 1000

ACHROMYCIN*

*REGD. TRADE MARK TETRACYCLINE

Also available in the following forms: Ear Solution · Intramuscular · Intravenous · Ointment 3% · Ointment (Ophthalmic) 1% · Ophthalmic Powder Sterilized · Oral Suspension · Liquid Pediatric Drops SPERSOIDS* Dispersible Powder · Soluble Tablets · Syrup · Tablets · Troches

Lederle **LEDERLE LABORATORIES DIVISION**

Cyanamid OF GREAT BRITAIN LTD., London, W.C.2

DeCORTISYL
PREDNISONE

and

PreCORTISYL
PREDNISOLONE

Prescribable on Form E.C.10 from 1st February 1957

ADVANTAGES

Superior therapeutic effect.
Little or no sodium and water retention

INDICATED ESPECIALLY

when Cortisone has failed or when electrolyte disturbance and water retention have occurred

DOSAGE: One quarter that of cortisone.

e.g. *in adults*: *initially* 20 to 40 mg. daily
maintenance 5 to 20 mg. daily

***in children*:** *initially* ½ to 1 mg./kg. daily
maintenance ⅛ to ¼ mg./kg. daily

Transfer to DeCortisyl or PreCortisyl requires no special precautions, other than maintaining continuity of treatment in equivalent dosage.

Scored tablets of 5 mg.
Bottles of 30 and 100
Basic N.H.S. Price
(cost to chemist)
37/6 and 120/-

ROUSSEL

847 HARROW ROAD,
LONDON, N.W.10

LS/21A